State of Utah
Division of Oil, Gas and Mining
Utah Coal Regulatory Program

Lila Canyon Significant Revision
ACT/007/013-98-1
October 19, 1999

File in:
- ❑ Confidential
- ❑ Shelf
- ☒ Expandable

Refer to Record No 0026 Date 10/18/1999
In C/007/013, 1999, Outgoing
For additional information

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INTRODUCTION

UtahAmerican Energy, Inc., has submitted a significant revision to the plan for the Horse Canyon Mine. A new mine would be built in Lila Canyon to access coal reserves to the south of the current Horse Canyon permit area.

The most recent re-submission was received on July 30, 1999. This second round of Technical Analysis for soils is in response to the most recent submittal. The chronology for the Lila Canyon Mine Permit Application Package (PAP) is as follows:

Action	Date
Original PAP submittal	September 8, 1998
Administratively incomplete, PAP returned	November 6, 1998
Re-submittal	December 14, 1998
Administratively incomplete	February 1, 1999
Re-submittal	February 11, 1999
Administratively Complete	February 25, 1999
1st round - Technical Analysis w/ deficiencies	May 26, 1999
Re-submittal	July 30, 1999

In the sections of the application dealing with ownership and control and right of entry, the applicant has chosen to include land ownership information for both permit area "B," the proposed addition to the permit area, and for permit area "A," the existing Horse Canyon permit area. Therefore, to be consistent, this review considers the completeness and adequacy of land ownership, legal descriptions and right of entry information for both of these areas.

There are several technical issues that need to be resolved before the application can be approved.

SUMMARY OF OUTSTADING DEFICIENCIES

*DEF . . 19, 21, 22, 24, 25, 28, 29, 33, 38, 40, 43, 53, 54, 55, 56, 60, 61, 62, 65, 67, 68, 69, 72, 73, 74, 77, 78, 84, 85, 86, 87, 88, 89, 90, 92, 102, 103, 105, 106, 109, 112, 113, 116, 121, 122, 123, 124, 125

ADMINISTRATIVE INFORMATION

R645-301-112.310, Ownership and control information in the application is unclear. The application is required to show the ownership or control relationship of the persons that own or control the applicant, including percentage of ownership and location in organizational structure. Additional information about officers and directors and coal mining and reclamation operations may be needed.

R645-301-112.500 and -112.600, Land ownership information in Table 1-1 and Plates 4-1, 5-3, and 5-4 needs to be consistent and accurate.

R645-301-114, Acreage figures in the application need to correspond.

R645-301-114, The application needs to include right of entry information for the portions of the proposed revised permit area in the E½ SE¼ and SW¼ of Section 15 of Township 16 South, Range 14 East, the proposed facilities area.

R645-301-115, The application needs to contain approval from the public road authority authorizing mining and reclamation operations within 100 feet of a public road.

R645-301-117.100, The certificate of insurance needs to be changed to be in compliance with Division requirements.

ENVIRONMENTAL RESOURCE INFORMATION

R645-301-521.190, The Permittee must send the Division a legal description of the permit area. The legal description should describe all lands in the permit to the nearest quarter quarter section. The Permittee must also state how many acres in the permit area are Federal, State or private.

R645-301-724 The applicant should provide seasonal and monthly records of precipitation data. The applicant should submit seasonal temperature data.

R645-301-131, All technical data submitted in the permit application must be accompanied by the names of persons or organizations that collected and analyzed the data, dates of the collection and analysis of the data, and descriptions of the methodology used to collect and analyze the data. This information is not complete for some studies in Appendices 3-1 and 3-2.

R645-301-321, The applicant needs to provide vegetation information adequate to statistically compare the area that would be disturbed with a reference area or range site or adequate to use as a baseline success standard. This includes an adequate number of samples to compare proposed disturbed and reference areas statistically. The entire proposed disturbed area needs to be included in the sample. In addition, the applicant should provide a discussion of other aspects important in comparing the proposed disturbed and reference areas, such as slope, aspect, and soils.

SUMMARY OF OUTSTANDING DEFICIENCIES

R645-301-321, The applicant needs to check plants identified as *Ferocactus* sp. and Engelmann spruce. If the identifications are correct, the plants would be state records for elevation and range.

R645-301-322, The Fish and Wildlife Service commented, and the Division agrees, that Table 3-1 either needs a complete listing of threatened and endangered species that occur in Emery county or it needs to be eliminated. If eliminated, the application should mention the Fish and Wildlife Service believes there is potential habitat for the southwestern willow flycatcher in Emery county.

R645-301-322, The applicant needs to confirm whether habitat for the southwestern willow flycatcher exists in the proposed addition to the permit area. While there is no indication this habitat is present, and while this is discussed in this analysis, the application needs to contain this documentation.

R645-301-322, The maps showing wildlife habitat need to contain the information provided on USGS 1:24,000 scale maps, including contours. At least one of the maps showing raptor nests should show the area of the proposed facilities, and information on nest locations should be consolidated onto one map. The map(s) need(s) to be of a small enough scale that the Division can make accurate measurements. Also, a map needs to include an overlay of the mine workings to better show which nests could be affected by subsidence.

R645-301-322, The application needs to discuss the raptor nests near the proposed facilities area and show whether they are visible from the mine or if they are shielded by vegetation or topography. It also needs to discuss potential effects from the proposed mine.

R645-301-322, It appears the applicant's consultant searched for and did not find Despain footcactus (*Pediocactus despainii*) and the Wright fishhook cactus (*Sclerocactus wrightiae*) in the proposed disturbed area. This needs to be documented in the application.

R645-301-222 through R645-301-222.300, Appendix 2-2 does not contain information for the RZH soil map unit which is shown on the general Order 3 soil map 2-1 as located within the Permit Area "B" for Lila Canyon boundary.

R645-301-141, The Order 1 soil survey map, both in Appendix 2-3 and on Plate 2-2, and the Salvageable Soils Map, Appendix A2 of Appendix 2-3, have discontinuous 25 feet contour lines within the surface disturbance area. Present this map with continuous contour lines.

R645-301-411, In one section, the application says there are no agricultural activities within the proposed addition to the permit area; however, grazing is considered an agricultural activity. This needs to be corrected.

R645-301-411, The Bureau of Land management's 1999 Utah Wilderness Inventory indicates part of the proposed addition to the permit area has wilderness characteristics, including land immediately adjacent to and possibly overlapping the proposed disturbed area. The application needs to provide documentation of the Bureau of Land Management's management plans for the area.

R645-302.122, -624.130 - Outside sources are referenced many times but the outside sources are not adequately described or listed in a "reference" section.

R645-301-302.122, -624.130, -624.320 - The applicant asserts that over 100-years of mining experience at the adjacent Sunnyside Mines indicates that none of the horizons contain acid- or toxic-forming materials in quantities sufficient to be considered a problem, but no data are presented to substantiate this assertion.

R645-301-624.320 - There are no reports of chemical analyses for acid- or toxic-forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined, including the rock through which the tunnels will be built.

R645-301-624, -624.210 - Two wells were located in the alluvium in lower Horse Canyon Creek. It is not clear whether the well that is nearer the Horse Canyon surface facilities has been sealed and abandoned (as indicated Section 724.100) or is operational and is to be used during mining and reclamation operations (as indicated in Section 722.400). There are no hydrologic data from either well in the PAP.

R645-301-731 The applicant should identify if any of the upper reaches of Lila Canyon and Little Park Wash are perennial or intermittent.

R645-301-624, -624.210 - Two wells were located in the alluvium in lower Horse Canyon Creek. It is not clear whether the well located nearer the Horse Canyon surface facilities has been sealed and abandoned (as indicated to Section 724.100, page 11) or is operational and is to be used during mining and reclamation operations (as indicated in Section 722.400). There are no data from either well in the PAP.

R645-301-724.100 - There are seasonal water-level measurements in the PAP for IPA-1, IPA-2, and IPA-3 for 1994, 1995, and 1996 but no measurements for 1997, 1998, or 1999.

R645-301-724.100, -724.200 - The 1997 quarterly samples from Redden Spring (RS-2), HC-1, HC-2 (B-1), and RF-1 were analyzed for all required parameters except total manganese.

R645-301-724.100, -724.200 - The following data are briefly mentioned in Appendix 7-3; however, the actual data are not in the PAP, the results of the analyses are not discussed with the baseline information, and there is no reference to the source of these data:

- RS-1 and RS-2 (Redden Spring) were sampled once a year during 1978, 1979, and 1980 and analyzed for most major chemical constituents.
- Springs H-6, H-18, and H-21 were sampled once and analyzed for the major constituents in 1985.
- Third quarter data for 1989 were collected for HC-1 and RF-1 and sampled for most of the parameters in UDOGM's guidelines.
- Between January 1981 and April 1983, baseline water quality data were collected for surface water and spring sites B-1 (HC-2), HC-1, RF-1 and RS-2 on the Horse Canyon permit area. Between 14 and 19 samples, depending on the site, were taken and analyzed during the monitoring period.
- The U.S. Geological Survey conducted a water quality study in Horse Canyon from August 1978 until September 1979. Samples were taken monthly from the Horse Canyon Creek and analyzed for most major ions and cations and field parameters. Metals, eight nitrogen species and other minor chemical constituents were taken on a quarterly basis or less.

R645-301-724.200 - There are no baseline data for the stream in Little Park Wash, the main drainage through the permit area. Little Park Wash is mentioned Sections 724.100 and 724.200 and in Tables 7-2 and 7-3 but is not further described or discussed.

R645-301-724.200 - Range Creek drainage is mentioned in Section 724.100 but Range Creek is not further described or discussed. There are no baseline data.

R645-301-724.200 - Flow and water-quality data for Horse Canyon Creek (HC-1, HC-2, and RF-1) from the Horse Canyon Mine 1997 Annual Report are in Appendix 7-2, and 1994 data for HC-2 are in Appendix 7-6. Additional data for Horse Canyon Creek are available from other annual reports of the Horse Canyon Mine and these data should be included and evaluated in the PAP.

R645-301-724.200, -728 - In the PHC the applicant finds that to date there is no known depletion of flow and quality of surveyed springs in the Horse Canyon permit area. The basis for this determination is not clear: in Section 724.100 (page 13) of the PAP the applicant states that it is impossible to precisely describe the area's pre-mining hydrology.

R645-301-724.200, -728 - In the PHC (Appendix 7-3) the applicant finds that, due to the close proximity and similarities of mining and drainage conditions, water quality and impacts to the channels from pumping the Lila Canyon Mine would be very similar to those experienced in the adjacent Horse Canyon Mine. However, the water-quality and downstream impacts that resulted from pumping the Horse Canyon Mine are not described or discussed adequately enough in the PAP for this comparison to be meaningful.

R645-301-724, -728 - In the PHC the applicant finds that, based on available data and expected mining conditions, the proposed mining and reclamation activity is not expected to proximately result in contamination, diminution or interruption of any underground or surface source of water within the proposed permit or adjacent areas; however, some subjects, such as acid-forming or toxic-forming materials, flooding or streamflow alteration, and ground water and surface water availability, that are not clearly covered in the PHC could use further clarification. Numerous technical deficiencies have been identified in the PAP. Additional information that will be provided to meet those deficiencies may necessitate revision or at least expansion of the PHC determination.

R645-301-731.210 - Two of the springs proposed for operational monitoring, L-6-G (Mont Spring) and L-7-G (Leslie Spring), correspond roughly with a group of springs monitored by JBR Consultants in 1985:

- The correlation between the JBR springs and L-6-G and L-7-G is not clear.
- Baseline data in the PAP for the JBR springs is not adequate (1994 and 1995 but nothing more recent) .

R645-301-731.210 - Four of the springs proposed for operational monitoring are identified by the applicant as L-8-G (Cottonwood Spring), L-9-G, L-10-G (Pine Spring), and L-11-G and correspond with the springs monitored by EarthFax as 9, 10, 22, and 13A, respectively:

- Springs 9 and 10 have data from 1993, 1994, and 1995 but nothing more recent.
- The PAP contains some data on field parameters from 1995 and 1993 for Springs 22 and 13A but no analysis reports: these two springs were usually observed to be dry from 1993 to 1995.

R645-301-731.210, -731.220 - The parameters in Table 7-4 closely match those in Tech 004 except that dissolved iron and total alkalinity are not listed. Measuring total alkalinity is a necessary step in determining carbonate and bicarbonate so it is usually reported routinely by laboratories along with carbonate and bicarbonate, and it should be included by the applicant in Table 7-4.

R645-301-731.210, -731.220 - Dissolved iron should be added to Table 7-4.

R645-301-731.210, -731.220 - Total manganese is listed in the body of Table 7-4 with a footnote that analysis will be done for dissolved manganese; this has the potential for causing confusion in the future and the two parameters should be specifically and separately listed in Table 7-4.

R645-301-731.210, -731.220 - Table 7-4 indicates that oil and grease is to be analyzed for in samples taken below the mine site only rather than at sites both above and below as recommended in Tech 004. A footnote indicates that this analysis will be done for designated samples. Oil-and-grease needs to be determined both above and below the mine site to be an effective water-quality indicator, and the sites at which it will be determined need to be clarified.

R645-301-731.210, -731.220 - Table 7-4 indicates that cation anion balance is to be determined only for surface-water samples taken below the mine site rather than at all locations: this is an important quality control measure and should be routine in all water-quality analyses.

R645-301-731.220 - No monitoring is proposed for Little Park Wash, which appears to be the major surface drainage in the permit area. The reasoning for not monitoring is not discussed in the PAP.

R645-301-323, The application needs to contain maps showing the reference areas and vegetation communities in relation to the proposed surface facilities. The maps need to contain information as required in R645-301-140.

R645-301-622.100, -722.300 - The location of S-32 is not shown on any map: it can be determined from the log in Appendix 6-1 that it is in T. 17 S., R. 15 E. but the Section cannot be identified because of the poor quality of the copy.

R645-301-624.100, -624.110 - Reference is made in several places in the text to the Sunnyside fault, a feature that possibly controls ground-water flow and coal recovery, but this fault is not shown on the maps.

R645-301-623, -722, -731.521 - There is no cross section showing the relationship of the rock tunnels to geologic structure, stratigraphy, and ground water.

R645-301-624.100, -722.100 - Water-level elevation contours based on the three IPA wells are on Plate 7-1; otherwise, areal and vertical distribution of aquifers within the proposed permit or adjacent areas is not shown on maps and cross-sections. There are no cross sections showing location and extent of ground water and its relation to geologic structure and stratigraphy.

R645-301-722.100 - A water right for the Minerals Development Corporation (MDC) well is listed in Table 7-2. The MDC well and another well that is located nearer the Horse Canyon Mine surface facilities are discussed in Section 722.400. Both wells are shown on Plate 7-1 but they are not clearly identified.

R645-301-722.100, -722.300 - The ground-water elevation at the intersection of the Main slope and 3rd level in the Horse Canyon Mine, at the rotary car dump, is described in Section 724.100 (page 14) in Chapter 7 as "representative of the potentiometric surface in the rest of the mine."; it was approximately 5,800 feet in 1986 and the applicant states that it probably has remained at this level since operations ceased in the Horse Canyon Mine:

- The location is described in the text but is not shown on Plate 7-1 or other maps.

- This "representative" ground-water elevation does not appear to have been used in projecting the piezometric surface mapped on Plate 7-1.

R645-301-722.100 - Seasonal variations in water levels tabulated in Appendix 7-1 are not portrayed on cross sections or contour maps.

R645-301-722.100 - Range Creek drainage is mentioned in the description of the ground-water divide of the main aquifer in Section 724.100 but Range Creek is not labeled on maps.

R645-301-722.200 -722.300 - Locations of all known seeps and springs are stated to be shown on Plate 7-1; however:

- Water quality and quantity data for springs or seeps 8B, 15A, 17B, 18A, 19C, HC-2, HC-4, HC-9, HC-11, HC-13, HC-14, HC-18, HCSW-1, and HCSW-3 are in Appendices 7-1 and data sheets for some are in Appendix 7-6, but their locations could not be found on Plate 7-1.

- H-7, H-8, H-9, H-10, H-11, H-13, H-14, H-18, H-19, H-20, H-21, and H-22 are listed in Table 7-1 and data sheets for some are in Appendix 7-6, but their locations could not be found on Plate 7-1.

- Water rights for several springs are listed in Table 7-2 and locations are on Plate 7-3. Some of the locations in Table 7-2 and on Plate 7-3 correspond roughly with springs shown on Plate 7-1, but they do not clearly correspond to springs on Plate 7-1: it is often unclear whether or not the two maps are showing the same spring.

- RS-2 (Redden Spring, water right 91-4959) is at the same location on Plates 7-3 and 7-4, but on Plate7-1 that location is labeled H-6 and RS-2 is farther west (RF-1 is also farther west on 7-1 than on 7-4).

- The star, large black-circle (IPA wells), and black-square symbols used on Plate 7-1 are not explained in the Legend. The symbols for L-1-S through L-5-S are not explained in the Legend.

R645-301-724.100 - The applicant states that HC-1A is not on Plate 7-1 because no sample data or pertinent information are available; however, HC-1A is on Plate 7-1.

R645-301-722.200 -722.300 - Acknowledging that point-of-diversion locations such as those in Table 7-2 and on Plate 7-3 are often imprecise:

- The location of RS-2 (Redden Spring, water right 91-4959) on Plates 7-1, 7-3, and 7-4 (NE 3, T. 16 S., R. 14 E.) doesn't match that described in Table 7-2 (NW 3, T. 16 S., R. 14 E.).

- The location of Konna Spring on Plate 7-3 (NE 8, T. 16 S., R. 15 E.) does not match that given in Table 7-2 (SW 18, T. 16 S., R. 15 E.).

- The location of Cottonwood Spring (L-8-G) on Plate 7-1 does not match that on Plate 7-3 and in Table 7-2.

R645-301-722 - Surface-elevation contours are displayed on several maps. On Plate 7-1 the 250-foot index contours were not printed, making it difficult to determine surface elevations.

R645-301-521.190, The Permittee must give the Division predisturbed, operational and reclamation contour maps that have a scale of not less than 1 inch equals 100 feet and has 2 foot contour intervals.

R645-301-521.190, The Permittee must give the Division copies of the aerial photographs that show the predisturbed area. If the Division were to reclaim the site, those photographs would be helpful in restoring the area.

OPERATION PLAN

R645-301-121.200, On Page 33, Section 523 the word cjould should be spelled could.

R645-301-121.200, On Page 68, Section 528.320 the Permittee states that coal mine waste will be place in new or existing disposal areas. The Permittee must either identify all existing coal mine waste disposal areas or change the wording. At present there are not existing disposal areas in the permitted area.

R645-301-521.190, The Permittee must state the maximum amount of coal that will be stored on site.

R645-301-536, The Permittee must give the Division detailed plans for the refuse disposal areas where the material from the rock tunnels will be placed.

R645-301-526.133 and R645-301-526.116, The Permittee must show how the public will be protected from mining and reclamation activities that are constructed within 100 feet of the county road. Specifically the Permittee must address how the public will be protected from the hazards associated with the sediment pond and other mine facilities.

R645-301-121.200, The Permittee must either include the letter from Emery County stating that they have approved the construction of the mine facilities next to the county road or remove the reference.

R645-301-420, The text of the application needs to show the applicant has submitted a Notice of Intent with the Division of Air Quality and that Air Quality has issued its Intent to Approve. Contrary to the application, Appendix 4-3 does not contain a copy of the Air Quality Permit (or Approval Order).

R645-301-522 and R645-301-525.240, The Permittee must give the Division a detailed coal recovery plan. That plan must include the coal extraction ratios and the calculations for the longwall areas, full extraction room-and-pillar areas and first mining only areas.

R645-301-332, Section 525.100 indicates there are no renewable resource lands within the proposed addition to the permit area; however, according to the definition of renewable resource lands and information in the land use chapter of the application, the proposed addition to the permit area does include renewable resource lands.

R645-301-332, The applicant needs to show how the effects of underground mining on vegetation will be monitored.

R645-301-121.200, The Permittee must use a standard angle of draw for subsidence calculation of justify why different angles of draw are used. On Page 32, of the PAP Section 522 the Permittee states that the width of the escarpment barrier will be determined by implementing a 20° angle of draw. On Plate 5-5 the Permittee states that a 21.5° angle of draw was used to find the maximum extent of subsidence.

R645-301-121.200, The Permittee must state why a buffer zone of 200 feet was used to protect the escarpments from subsidence.

R645-301-525.490 and R645-301-525.440, The Permittee must show on Plate 5-5 or other similar maps those surface structures such as seeps and springs and eagle nests. that need to be protected from subsidence.

R645-301-525.100, The Permittee must provide the Division with a map of the permit area at a scale of 1:12,000 or larger that shows the areas where subsidence could occur.

R645-301-525.440, The Permittee does not give details of the subsidence monitoring plan. The only information about the plan is that it will involve ground and aerial surveys. The Division needs more details about the subsidence monitoring plan before it can be evaluated. The additional information must include but not be limited to the location of all subsidence monitoring points on the subsidence maps (Plate 5-5).

R645-301-525.120, The Permittee must describe the potential damage to State-appropriated water rights. Since the Division has received comment from water users about the potential for damage to water rights the Permittee must address this issue. The Permittee must also describe the potential subsidence effects on the eagle nests.

R645-301-121.200, The word "extend" must be replaced with "extent" in Section 525.160 of the MRP.

R645-301-121.200, Reference to a ground survey being needed to verify subsidence damage in Sections 525.160 and 525.321 must be removed from the text. The Permittee is responsible for any subsidence damage whether or not they conduct a ground survey. For example if subsidence was suspected of damaging a spring a ground survey may not be the proper method to verify the claim.

R645-301-121.300, The Permittee must submit the subsidence information in the format required by the Division. The format used by the Permittee in the subsidence section of the amendment does not correspond to the format in the Utah Coal Rules Revised May 1, 1988. The May 1, 1988 rules were superseded by the November 1, 1996 rules.

For example the November 1, 1996 do not have sections R645-301-525.131, R645-301-525.132, R645-301-525.133, R645-301-525.134, R645-301-525.140, R645-301-525.150, R645-301-525.160, R645-301-525.170 while the PAP does.

Section 525.200 of the PAP discusses subsidence control, while Section R645-301-525.200 of the November 1, 1996 rules deals with protected areas. Section 525.300 of the PAP discusses notification of surface owners, while Section R645-301-525.300 of the November 1, 1996 rules deals with subsidence control.

The PAP does not address Sections R645-301-525.400, R645-301-525.460, R645-301-525.470, R645-301-525.480, R645-301-525.490, R645-301-525.500, R645-301-525.540, R645-301-525.550, R645-301-525.600, and R645-301-525.700,

Note: The Division will supply the Permittee with a hard or electronic copy of the current Utah Coal Rules upon request. The Permittee can get a current electronic copy of the Utah Coal Rules at http://161.119.62.173/mining/rulecoal.htm or visit the Division's homepage at http://dogm.nr.state.ut.us/

R645-301-332,Section 525.100, There are no renewable resource lands within the proposed addition to the permit area; however, according to the definition of renewable resource lands and information in the land use chapter of the application, the proposed addition to the permit area does include renewable resource lands. The Permittee must state that renewable resources are located in the permit area.

R645-301-332, The applicant needs to show how the effects of underground mining on vegetation will be monitored.

R645-301-333, In Section 333, the application says the major impacts to wildlife in and around the mine will be the loss of habitat during construction. It also says most wildlife will either accept the mine or adjust behavior to coexist with the operation. These statements need to be modified since the major impacts on wildlife from the mine will be associated with operations.

R645-301-333, The wildlife education program needs to specifically include instructions to remove wildlife carcasses well off the road to avoid collisions with scavenging raptors.

R645-301-333, The applicant needs to make a definitive commitment regarding firearm and off road vehicle use in its area of control.

R645-301-333, The Division of Wildlife Resources commented there are bighorn sheep that spend the entire year in Lila Canyon, and the mine will adversely affect these animals. In addition, the area is heavily used by chukars, and this use would also be negatively affected. The applicant needs to show how it will mitigate for effects on critical big game and other habitat and show how negative effects will be minimized. Wildlife Resources suggests the applicant install at least one artificial watering device, such as a guzzler, to benefit chukars in the area.

R645-301-333, The applicant has committed to consult with the Fish and Wildlife Service and Division of Wildlife Resources concerning the eagle nests near the proposed facilities. The application needs to contain the results of this consultation, including protection and mitigation plans.

R645-301-333, The application says a raptor inventory will be conducted to ensure that no bald or golden eagles or adversely affected by mining, but this statement needs to apply to all raptors.

R645-301-333, The applicant has committed to not subside escarpments that contain eagle nests, but it appears the area near at least one nest would be subsided. The applicant needs to show how nests in the subsidence areas would be protected. Additionally, it is very difficult using the maps in the application to determine where nests are located in relation to the proposed mining activities, but this problem is addressed under R645-301-32 n this review.

R645-301-232.100 through R645-301-232.500, The total volume of soil needed for reclamation (131,667 cubic yards) will require salvaging and protecting most of the available topsoil and rooting-depth subsoil resources within the disturbed area as identified in the Order 1 soil survey. All topsoil and rooting-depth subsoil resources must be protected and/or preserved for reclamation. Topsoil and rooting-depth subsoils may not be mixed or contaminated with unsuitable soil materials containing excess rock or Mancoes shales.

R645-301-333, Identify what measures will be made during the life of the mine to protect the island of undisturbed topsoil resources from mining related impacts, such as blowing coal fines, vehicle traffic, and other uses that would disturb and/or otherwise negatively impact these undisturbed areas and topsoil resources.

R645-301-232.700 and R645-301-232.710, Identify specific areas inaccessible for construction machinery where soils can not be salvaged due to adverse, unsafe or impractical conditions. All soils must be salvaged on steep slopes and/or rocky areas accessible to construction machinery for the purpose of constructing cut slopes or grading flat areas.

R645-301-120 and R645-301-140, Clearly identify, locate, and present where cut and fill slopes will occur as described in the text. Provide a cut and fill contour map correlated with discussions from both the operations and reclamation sections.

R645-301-231.100 through R645-301-232.300, and R645-301-234.100 through R645-301-234.240, Section 232.100 states that boulders of approximately three feet in diameter and larger will be separated from the topsoil and piled or placed at appropriate locations. The following need clarification in the PAP:

- Designate a "topsoil" rock stockpile on maps where salvaged rock will be stored for reclamation use, and sign these piles accordingly during the life of the mine.

- Or, include rock with soil salvage and store with soil in topsoil stockpile.

R645-301-100 (Underground Development Waste, Coal Mine Waste, Refuse Pile), R645-301-528.200 through R645-301-528.322, and R645-301-536 through R645-301-536.900, Identify the rock-slope waste material as Underground Development Waste. Place and properly dispose of all Underground Development Waste in a Refuse Pile. If Underground Development Waste is used as pad fill, then the pad fill must meet the permit requirements for an approved disposal area.

R645-301-553.252, The PAP states that the refuse pile will be covered with 24 inches of soil. Correct the PAP so that the refuse pile, upon final grading is covered with a minimum of four feet of the **best available,** nontoxic and noncombustible material.

R645-301-553.252 and R645-301-233, Section 232.500 and Appendix 5-7 state subsoil will be removed from RBL area to minimum depth of 24 inches. The Order 1 soil survey, test pit LC10, shows that topsoil cover is approximately 6 to 8 inches and that immediate subsoils 6 inches and greater in depth contain 65 to 80 percent Mancos shale fragments. Only suitable topsoil and subsoil may be salvaged and used for reclamation; Mancos has not been approved for salvage.

R645-301-234.220 through R645-301-234.230, The application states that the topsoil stockpile will be located and protected to avoid contamination and unacceptable compaction. The plan further states that the slopes will have an irregular, pitted surface or contour furrows to help retain precipitation and minimize runoff. The following are needed:

- Soil scrappers have been shown to induce soil compaction. State how compaction will be alleviated.

- Section 234.230 states that surface roughening will consist of contour furrows and constructing an irregular, pitted surface. These two practices are not compatible; commit to using one or the other exclusively. If contour furrows are used, engineer furrow placement, slope, and size to control erosion; provide contour furrow design, maps, and cross sections.

R645-301-234.200 through R645-301-234.240, R645-301-521.160, R645-301-521.165, Additional information is needed concerning soil stockpile pile size and dimensions.

- Topsoil Stockpile - Size the topsoil to store the 41,893 CY of topsoil as identified in the PAP.

- Subsoil Stockpile - Size the subsoil pile to store the additional 89,774 CY of subsoil as identified in the PAP. Provide the location and placement of the subsoil stockpile.

- Stockpiles - Provide engineered drawings of projected stockpiles, showing size, exact placement, final configuration and cross sections of each stockpile. Details are needed for the following stockpiles:
  - topsoil stockpile,
  - subsoil stockpile, and
  - "topsoil" rock (boulders and large stones) stockpile.

R645-301-331, The applicant needs to clarify the use of the terms affected area and disturbed area. Also, the discussion in the second paragraph of Section 331 about how much land might be available for wildlife use is confusing and may be unnecessary.

R645-301-724.400, The application contains conflicting precipitation information, and this needs to be resolved.

R645-301-331, Grasses or forbs only would be seeded for interim revegetation, but the broadleaf forbs would not provide adequate erosion protection and the seeding rate is minimal for the grasses alone. Both should be used together, and the Division recommends certain changes to the seeding rates and species being seeded.

R645-301-527.200, The Permittee must give the Division the cross sections that were used in the embankment stability analysis and also state why the assumption used in the Hoek method were valid. The assumption used in the construction of the charts area:

- The material forming the slope is assumed to be homogeneous
- The shear strength of the material is characterized by a cohesion c and a friction angle φ.
- Failure is assumed to occur on a circular failure surface which passes through the toe of the slope.
- A vertical tension crack is assumed to occur in the upper surface of the slope.
- The location of the tension crack is assumed and of the failure surface are such that the factor of safety of the slope is a minimum for the slope geometry and groundwater conditions considered.

R645-301-527.200, The Permittee must give the Division plans for each surface conveyor.

R645-301-527 and R645-301-534, The Permittee must give the Division certified plans and drawings for the roads in the Lila Canyon area. The plans are drawing in Appendix 5-4 are not certified. In addition, the plans and drawings must contain the following information:

- Include a map, appropriate cross sections, design drawings, and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures;

- Describe the plans to remove and reclaim each road that would not be retained under an approved postmining land use, and the schedule for this removal and reclamation.

R645-301-528.320, The Permittee must identify all existing disposal areas were coal mine waste will be disposed. If no existing disposal areas exist then the Permittee must remove the reference to existing disposal areas from the PAP.

R645-301-528.320 and R645-301-536, The Permittee must place all rock material from the rock slopes into approved disposal areas. If the Permittee wants to use the material from the rock tunnels as fill material for the pad then the Permittee must permit the area as a refuse pile.

R645-301-553.252, The Permittee must either commit to cover the refuse pile with 4 feet of material or demonstrate to the Division that a lesser amount is needed.

R645-301-536.100, The designs for the refuse pile must include the detailed cross sections that were used for stability analysis. The detailed cross section and failure surface are needed to verify that the assumptions used to determine the safety factor are valid.

R645-301-731.521 - The numbers provided in the PAP indicate ground-water levels would need to rise approximately 150 feet just to reach the starting elevation of the tunnels (from 6,000 feet to 6,150 feet) and 300 feet to reach the intersection of the tunnels with the coal seam (from 6,000 feet to 6,300 feet). The applicant states Section 731.521 that the water level in the mine would need to rise approximately 20 feet to reach the contact of the rock slope with the coal seam and produce a gravity discharge through the tunnels: it is not clear what this means.

R645-301-731.210 - It is not clear from the PAP how long baseline monitoring will be continued and when operational ground- and surface-water monitoring will begin.

R645-301-533.700, The Permittee must label the contour lines on Plate 7-6. The Permittee must also show the correct location of the emergency spillway on the contour maps. The elevation of the emergency spillway is shown between 5839 and 5841 feet on Plate 7-6. The table shows the elevation to be 5841 feet.

R645-301-533.100, The Permittee must give the Division the detailed cross sections that were used in the slope stability analysis. Those cross sections are needed

R645-301-533.210, The Permittee give the Division the physical and engineering properties of the sediment pond foundations.

R645-301-533.300, The Permittee must show how the pond will be protected against sudden drawdown. Specifically the Permittee must show that pore pressure in the embankments will not cause the pond to fail should a sudden drawdown occur.

R645-301-521.190, The Permittee must provide the Division with a copy of the letter from the State Engineer stating that the sediment pond design has been approved.

R645-301-731 The applicant should size the undisturbed drainage culvert in Lila Canyon to account for floods, debris, sediment load and overflow from sedimentation pond. The sizing calculations should incorporate a curve number value from antecedent moisture condition III, since the culvert will be used during reclamation and visited infrequently.

R645-301-222 The applicant should submit contingency plan to treat groundwater in the event contaminated groundwater is contacted in volumes that have to be discharged from the mine.

R645-301-752 The applicant should commit to evaluating channel morphology parameters and erosion impacts if mine water should be discharged into Lila Canyon.

R645-301-528.100, The Permittee must show the coal storage areas on the surface facilities maps. The Permittee will only be allowed to store coal in those coal storage areas outlined on the surface facilities map. The Permittee must also label the coal loading and transportation areas.

R645-301-525.490, The Permittee must show on Plate 5-5 or other similar maps those areas where subsidence control methods (first mining only) will be used to protect surface structures such as escarpments, seeps and springs and eagle nests.

R645-301-525.100, The Permittee must provide the Division with a map of the permit area at a scale of 1:12,000 or larger that shows the areas where subsidence could occur.

R645-301-527 and R645-301-534, The Permittee must provide the Division with certified plans and drawings for the roads in the Lila Canyon area. The plans and drawings must contain the following information:

Include a map, appropriate cross-sections, design drawings, and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures.

RECLAMATION PLAN

R645-301-537.200, The Permittee states in Section 537.200 of the PAP that material from the rock slopes will be left in place during final reclamation as settled and revegetated fill. The settled and revegetated fill regulation deal with materials placed before the enactment of SMCRA. Since the site is undisturbed, the Division will not allow the Permittee to leave settled and revegetated will in place if that material does not meet AOC requirements.

R645-301-553.120, In Section 553.120, The Permittee states that all highwalls will be eliminated. However, the Permittee did not give the Division detailed maps and cross sections of the portal areas. Without that information the Division cannot make a finding about the adequacy of the highwall elimination plan. The Division needs a cross section of profile of each portal. The portals must be identified on the cross sections.

R645-301-553.130, In Section 553.130, The Permittee states that all reclaimed slopes will have a static safety factor of at least 1.3. The Permittee did not provide the slope stability analysis that supports the 1.3 safety factor claims.

R645-301-553.300, In Section 553.300, The Permittee states that all coal seams and/or combustible material will be adequately covered to prevent spontaneous combustion. However, the Permittee does not state what or where that material is located. The Permittee must clarify the statements about covering coal seams and other combustible materials.

R645-301-553.400 and R645-301-121.200, The Permittee states, in Section 553.410 of the PAP, that cut and fill terraces may be used to reclaim the mine portal pads. The Permittee then states in Section 553.420 that no terraces will bed used. The Permittee needs to present consistent information.

R645-301-553.230, The Permittee states that all recontoured areas will be compacted to reduce soil slippage and the have 3 inches of topsoil placed. After the topsoil is placed, the soil will be ripped on the contour. The Permittee must explain how areas with slopes to steep to allow equipment to operate on the contour will have topsoil placed.

R645-301-120, The following items are needed to help add clarity and eliminate discrepancies in the plan:

- The location of cut and fill slopes is not clear. Please provide a cut and fill contour map to correlate with the discussion concerning backfilling cut slopes from adjacent pad areas.

- Clarify which adjacent pad areas (located within the disturbed area) will be used as work platforms for backfilling cut slopes and newly exposed hillsides.

- The statement that the adjacent reclamation pad area will be reclaimed in corresponding lifts is unclear since the pad is being removed, not built up.

R645-301-242, R645-301-244, Clarify and describe soil redistribution, placement, and stabilization:

- Describe whether Pocking will occur before or after topsoil placement. Describe the density of pock placement on the soil surface.

- Describe methods for minimizing and alleviating fill and replaced subsoil and topsoil compaction.

- Describe methods for reducing soil slippage between the fill and soil interface.

- Describe how stockpiled "topsoil" rock (boulders and large stones) will be placed on the surface and reincorporated with the redistributed topsoil.

- Correct the plan to indicate surface preparation practices that are compatible with the rocky soil and surfaces, and that are consistent with other reclamation practices (e.g., pocking). Drilling, discing or raking are not compatible with extreme rocky soils, rocky surfaces, or with surfaces that have been deep gouged or pocked.

R645-301-130, Section 231.300 and 243 are not in complete agreement on topsoil sampling procedures. Sections 231.300 and 243 refers to topsoil field sampling and testing. Please ensure that all sampling, testing and result interpretation is done by a qualified soil scientist. The soil scientist must be qualified to sample, test and interpret data results. Prior to sampling and testing of the topsoil material, the soil scientist's qualifications must be reviewed by the Division.

R642-742.312 The applicant should discuss how the large undisturbed culvert will be reclaimed and how much will be left in-place to provide for flows under the roadway.

R645-742.312 All reclaimed channels or other hydrologic structures should be designed using Antecedent Moisture Condition III, which yields a higher Curve Number value to ensure maximum protection of hydrologic features while unattended.

R645-301-341.100, The applicant needs to clarify the reclamation timetable in Table 3-3. There are terms used in this schedule that are not explained elsewhere in the application. Also, it is not clear where and in what sequence seeding and mulching listed for September 1, 2025, and September 30, 2025, would occur.

R645-301-341.110, R645-301-354, Table 3-3 indicates seeding and mulching could begin as early as September 1. Seeding of most species should be delayed until as late in the fall as possible, preferably until November. Seeding of warm season grasses should be done in the summer.

R645-301-341, The applicant needs to show how sufficient quantities of soil will be salvaged and redistributed to allow achievement of the revegetation performance standards. The Division finds specifically that it is necessary to remove, stockpile, and redistribute subsoil to achieve revegetation success, and the plan proposed by the applicant would not allow for adequate vegetation establishment. Some of the deeper subsoils, below the roots, have very high rock contents, and some are derived from marine shales that could

severely limit vegetation establishment and growth. If these materials were in the main rooting zone, it would be difficult or impossible to achieve revegetation success.

R645-301-341, Areas of coal mine waste disposal need to be covered with at least four feet of the best available nontoxic, noncombustible material to achieve revegetation in accordance with the R645-301-350 performance standards.

R645-301-341, Section 341.220 says tillage will continue until the size of the average soil clods on the surface is less than one inch. This is likely to unnecessarily compact the soil, and it reduces soil structure. It may be necessary to break up the largest clods, but continuing to till the soil until soil clods are less than one inch diameter is not necessary or desirable in this kind of site.

R645-301-341, The applicant needs to resolve inconsistencies in the reclamation methods shown in Section 341.220, Chapter 2, and Appendix 5-8. According to Section 341.220, the surface will be covered with 2000 pounds per acre of alfalfa or native grass hay which is crimp-disced into the soil, but this is not mentioned in Appendix 5-8. Appendix 5-8 and Chapter 2 discuss gouging but Section 341.220 does not.

R645-301-341, The Division considers water harvesting, such as gouging, to be an essential component of reclamation at this site. Any reclamation methods inconsistent with leaving a rough surface need to be modified or eliminated. In Appendix 5-8, the applicant commits to gouging the site, and crimp discing mulch and drill seeding are likely to reduce the gouges so they will not be as effective as they need to be.

R645-301-341, The application gives an approximate size for gouges, but the size shown is the minimum that should be used. The application should specify that the size shown will be the minimum size used.

R645-301-341, Assuming gouging will be the water harvesting method used, the applicant needs to describe how the gouges will be placed.

R645-301-341.210, Blue grama is an important warm season grass in the proposed disturbed area, and it needs to be included in the seed mix for final reclamation. Bluebunch wheatgrass is approximately an ecological equivalent of Salina wild rye, the dominant grass at the site. It should also be included in the seed mix.

R645-301-341.250, The proposed seed mixture includes introduced species that may not be desirable and necessary for achieving the postmining land use. The applicant needs to either eliminate these species from the seed mix or justify using them.

R645-301-341.210, The seeding rate shown in Table 3-4 is excessive. The *Interagency Forage and Conservation Planting Guide for Utah* recommends a broadcast seeding rate of 50-100 seeds per square foot.

R645-301-341.230, The application does not say what mulching method or rate will be used in accessible areas. It also does not say at what rate the straw mulch would be applied. If an area is inaccessible and would have straw applied, it would also be inaccessible to equipment needed to crimp the straw. The applicant needs to clarify the mulching methods and rates.

R645-301-341, The application says in Section 357.301 the Lila Canyon Mine would like to reserve the right to apply for augmentation of reclaimed areas without jeopardizing or extending the bond liability period on a site specific case scenario. Augmented seeding is not allowed without lengthening the extended liability period; therefore, the statement in 357.301 must be modified.

R645-301-341.250, The application says the reference area for the mine site disturbance was established adjacent to the existing facilities during the summer of 1985. It appears this statement is referring to the current Horse Canyon mining and reclamation plan. If the applicant intends to use the reference area at the Horse Canyon Mine, the application needs to include all pertinent data to compare the reference area with the proposed disturbed area.

R645-301.341.250, As discussed in the "Vegetation Resource Information" section of this analysis, there is inadequate information to determine whether the reference areas shown in Appendix 3-2 can be approved as success standards for vegetation cover or other vegetation parameters.

R645-301-341.250, The applicant needs to propose methods for measuring diversity, seasonality, and erosion control, and success standards for these parameters.

R645-301-341.250, The applicant needs to include the woody plant density success standard of 1500 per acre established in consultation between the Division and the Division of Wildlife Resources.

R645-301-342, In Section 342, the application says the sediment pond will be maintained through the life of the operation and bond liability period at which time it will be allowed to pass through normal pond succession until such time as the pond will be removed when effluent criteria are met at about year six following reclamation. This statement contradicts itself and other parts of the application and needs to be modified. The applicant needs to clarify how long the pond will be allowed to remain and what maintenance will be done. To leave the pond as wildlife habitat enhancement, the applicant would need to demonstrate that water in the pond would be suitable for wildlife use.

R645-301-342, The applicant needs to investigate whether other enhancement measures could be used at this site during the reclamation phase of operations. The application should contain a discussion of potential enhancement measures.

R645-301-342, Comments in the application about optimizing the edge effect should be eliminated unless the applicant provides specific means by which this will be accomplished.

Because precipitation figures in the application are inconsistent, the Division cannot be certain whether the species in the seed mix are adapted to the site. Some changes may be needed when the Division has reliable precipitation data.

R645-301-542, Plate 5-6 must show the center lines for the cross section in Plate 5-7A and Plate 5-7B.

R645-301-542, The Permittee must give the Division detailed cross section that show highwall elimination. The Division suggests that the cross sections that show highwall elimination be perpendicular to the cross section on Plate 5-7A and Plate 5-7B.

ADMINISTRATIVE FINDINGS

OWNERSHIP AND CONTROL INFORMATION

Regulatory Reference: R645-301-112

Analysis:

The applicant is UtahAmerican Energy, Inc., a Utah corporation. The application gives the name, address and telephone number of the applicant and its resident agent and includes the employer identification number for the applicant. UtahAmerican will pay the abandoned mine reclamation fee.

Section 112.300 of the application says ownership and control information is in Appendix 1-1, but Appendix 1-1 references Appendix 1-7 of Part "A" of the Horse Canyon mining and reclamation plan for ownership and control information. Section 112.340 says identifying information about affiliated coal mining and reclamation operations is in Appendix 1-2, but this appendix simply references Appendix 1-9 of Part "A" of the Horse Canyon plan for this information.

The application needs to clarify the relationships of the companies that own or are affiliated with the applicant. Appendix 1-7 of the Horse Canyon plan (Part "A") contains lists of shareholders and officers and directors for the applicant and its shareholder, Coal Resources, Inc., together with the dates the officers and directors assumed their positions, addresses, and their Social Security Numbers. It appears Coal Resources, Inc., is owned by Energy Resources, Inc. It is also possible Coal Resources is owned by Mill Creek Mining Co. which is owned by Energy Resources, Inc. It appears the other companies listed in Appendix 1-7 are tied to the applicant by common officers, directors, or stockholders. Because of the uncertainty about the relationships of the various companies, it is also uncertain whether the application needs to show the officers and directors of other companies.

No employer identification number is shown for Coal Resources, Inc. The application is required to contain the names and certain identifying information for each person that owns or controls the applicant or previously owned or controlled the applicant within the past five years. Section 112.340 has a list of companies, and Appendix 1-9 of the Horse Canyon plan contains employer identification numbers for most of these companies. However, it appears this information is incomplete since, based on the information in Appendix 1-7, UtahAmerican Energy is apparently owned by Coal Resources, Inc., and the application does not include this entity's EIN.

The application is also required to include the names, addresses, permit numbers, regulatory authorities, employer identification numbers, and MSHA numbers together with dates of issuance for coal mining and reclamation operations owned or controlled by the applicant or by any person that owns or controls the applicant. This information is in Appendix 1-9 of the Horse Canyon plan and Section 112.340 of the current application, but no permitted operations are shown for the following entities: Coal Resources, Inc.; PennAmerican Coal, Inc.; AmCoal Holdings, Inc.; Mill Creek Mining Company; Pinski Corporation; American Coal Sales Company; West Virginia Resources, Inc.; Pennsylvania Transloading, Inc.; Sunburst Resources, Inc.; Ohio Valley Resources, Inc.; and Spring Church Coal Company. It is not known whether these companies have associated coal mining and reclamation operations, and the

application needs to state whether they do or do not have permits. If any of them does, all required information needs to be included in the application.

The applicant has chosen to include land ownership information for both permit area "B," the proposed addition to the permit area, and for permit area "A," the existing Horse Canyon permit area. Therefore, to be consistent, this review considers the completeness and adequacy of land ownership, legal descriptions and right of entry information for both of these areas.

Section 112.500 of the text and Plates 4-1, 5-3, and 5-4 show surface and coal ownership in and contiguous to both the existing permit area and the proposed addition. The following items need to be corrected on the maps or in the text:

1. According to Plates 4-1 and 5-3, W. Marsing Livestock owns surface land contiguous to the proposed permit area addition. This is not reflected in the text.

2. SITLA commented in a letter dated April 9, 1999, that they administer lands in certain parts of the existing and proposed addition to the permit area and in contiguous areas. Two areas not properly identified on Plate 5-3 are in the S½ SW¼ of Section 4, and the NE¼ SW¼ of Section 25, Township 16 South, Range 14 East. SITLA administers all subsurface rights in the former area, but it does not administer coal rights in the latter.

The application shows MSHA identification numbers for both the Horse Canyon and Lila Canyon Mines, but it says the refuse pile identification number has yet to be issued. The applicant will need to obtain an MSHA identification number for the refuse pile.

According to this section of the application, there are no lands, interests in lands, options, or pending bids on interests held or made by the applicant for lands contiguous to the proposed addition to the permit area. Plates 4-1 and 5-3 shows federal leases to the south of the proposed addition to the permit area that are labeled "area of future mining."

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to approval, the applicant must provide the following in accordance with:

R645-301-112.310, Ownership and control information in the application is unclear. The application is required to show the ownership or control relationship of the persons that own or control the applicant, including percentage of ownership and location in organizational structure. Additional information about officers and directors and coal mining and reclamation operations may be needed.

R645-301-112.500 and -112.600, Land ownership information in Table 1-1 and Plates 4-1, 5-3, and 5-4 needs to be consistent and accurate.

VIOLATION INFORMATION

Regulatory Reference: R645-301-113

Analysis:

According to the application, neither UtahAmerican Energy nor any subsidiary, affiliate, or persons controlled by or under common control with them has had a federal or state permit suspended or revoked in the past five years, and these same entities have not forfeited a performance bond or similar security. The application says Appendix 1-3 contains a list of violations received by affiliated companies for the past three years, but Appendix 1-3 says these violations are listed in Appendix 1-8 of the Horse Canyon mining and reclamation plan.. It appears from this information there is one violation that has yet to be terminated and that administrative proceedings are ongoing.

Information in this and the ownership and control section will need to be checked in the applicant violator system, but it appears the application contains the required information to comply with R645-301-113.

Findings:

Information provided in the application is considered adequate to satisfy the requirements of this section of the regulations.

RIGHT OF ENTRY

Regulatory Reference: R645-301-114

Analysis:

The applicant has chosen to include land ownership information for both permit area "B," the proposed addition to the permit area, and for permit area "A," the existing Horse Canyon permit area. Therefore, to be consistent, this review considers the completeness and adequacy of land ownership, legal descriptions and right of entry information for both of these areas.

According to the application, UtahAmerican Energy has subleased 5544.01 acres of federal coal from Intermountain Power Agency (IPA). This was executed on August 24, 1998, and UtahAmerican Energy bases its right to enter on language contained in the leases and quoted in the application. The Bureau of Land Management approved the subleases on February 16, 1999.

Table 1-1 shows the legal descriptions and acreage for the federal leases. The total permit area, including both permit area "A" and permit area "B," would be 6461.79 acres. This acreage figure is consistent in two sections of the application and with information in correspondence from the applicant, but Section 411.130 says, "Within the permit area, all of the 9320 acres are managed by the BLM. . . . 910 acres are privately owned and 800 acres are owned by the State of Utah." These figures need to be consistent.

Parts of Sections 33 and 34, Township 15 South, Range 14 East, are in the current Horse Canyon permit area, and, according to Plate 5-4, they contain unleased federal coal. Therefore, while they may be considered part of the current permit area, the applicant has no right to mine these areas.

According to Plate 5-4 and other plates, the surface facilities would be built in Section 15 of Township 16 South, Range 14 East. The land is managed by the Bureau of Land Management, but it is not in the federal coal leases. The application includes a letter from the Bureau of Land Management indicating applications for rights of way for certain facilities have been received, but the application does not include required right of entry information for these areas.

The "Ownership and Control" section of this review discusses two areas where SITLA commented that they administer lands in the current permit area. They also commented that UtahAmerican Energy presently has no applications, leases, permits, rights of way, or rights of entry with SITLA to conduct any activities on or within these lands.

The applicant needs to present complete right of entry information for all parts of the current permit area and proposed addition to the permit area.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-114, Acreage figures in the application need to correspond.

R645-301-114, The application needs to include right of entry information for the portions of the proposed revised permit area in the E½ SE¼ and SW¼ of Section 15 of Township 16 South, Range 14 East, the proposed facilities area.

UNSUITABILITY CLAIMS

Regulatory Reference: R645-301-115

Analysis:

According to the application, the proposed addition to the permit area is not in an area designated as unsuitable for mining, and the applicant is not aware of petitions to designate the area as unsuitable. Mining operations will not be conducted within 300 feet of an occupied dwelling, but they would be within 100 feet of an Emery County road.

The application says UtahAmerican Energy has received permission from Emery County to construct mining facilities and conduct mining operations within 100 feet of the road and refers to a letter in Appendix 1-4, but the letter in this appendix is from the applicant requesting permission to mine within 100 feet of the road. There is no letter from the county.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-115, The application needs to contain approval from the public road authority authorizing mining and reclamation operations within 100 feet of a public road.

PERMIT TERM, INSURANCE, PROOF OF PUBLICATION, AND FACILITIES USED IN COMMON

Regulatory Reference: R645-301-116 and -117

Analysis:

The permit term for which the applicant is applying is five years. The beginning of construction is planned for 1999 with mining operations ending in 2023. This assumes adjacent federal leases can be acquired.

A certificate of liability insurance is in Appendix 8-2 & 8-3. This certificate does not meet Division requirements, and parts of the certificate in the application are not legible. Other items are:

1. The certificate holder named must be the Division of Oil, Gas and Mining.

2. The description of operations must provide the name of the mine and the mine number.

3. The insurance policy must be "first provider" insurance, that is, the insurance must pay without a deductible, all claims up to the legal requirements of the regulations ($300,000 per occurrence and $500,000 aggregate).

Appendix 1-5 contains copies of the newspaper advertisement and proof of publication.

No facilities or structures would be used in common with another coal mining and reclamation operation.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to approval , the applicant must supply the following in accordance with:

R645-301-117.100, The certificate of insurance needs to be changed to be in compliance with Division requirements.

TECHNICAL ANALYSIS

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR Sec. 783., et. al.

GENERAL

Regulatory Reference: 30 CFR Sec. 783.12; R645-301-411, -301-521, -301-721.

Analysis:

Referenced materials not on file at the Division or readily available to the Division will be provided upon request of the Division by the applicant (Section 120.122).

Outside sources are referenced many times in Chapters 6 and 7 and their appendices but are not adequately described nor listed in a reference section. Many of the publications cited are probably available to the Division and the general public through libraries, but they will be difficult to locate unless explicit citations are provided. Complete, usable references are needed, either at the end of each chapter or in one comprehensive reference section for the entire PAP. A partial References list is found at the end of Appendix 7-3, but the following citations from Chapters 6 and 7 (including Appendices) are not in that list:

Abbott and Liscomb, 1956.
Balsley and Horne, 1979.
Balsley, 1981 (perhaps a typo and should be the same as Balsley, 1980?).
Clark, 1928.
Doelling, 1972.
Fisher, 1936.
Fisher, Erdmann, and Reeside, 1960.
Osterwald and Mayberry, 1974 (perhaps same as F. W. Osterwald and J. O. Maheny, 1974?).
F. W. Osterwald and J. O. Maheny, 1974.
Sieler and Baskins, 1986.
Young, 1955, 1957, and 1966.
Waddell and others, 1983 (perhaps a typo and should be the same as Waddell and others, 1986?).

The Permittee gave the Division information in Section 521 of the PAP that describes the lands subject to coal mining and reclamation over the estimated life of mine. The general requirements of R645-301-521 have been met with respect to environmental resource information. The specific requirement of R645-301-521 will be addressed in the sections that follow.

PERMIT AREA

Regulatory Requirements: 30 CFR Sec. 783.12; R645-301-521.

Analysis:

Plate 5-4 and other maps show the permit boundaries for the Horse Canyon Mine. The permit boundaries are divided into Permit Area A, which is the Horse Canyon project that is now being reclaimed and Permit Area B, which is the proposed Lila Canyon project.

Besides the permit boundary map the Division needs to have a legal description of the permit boundaries to the nearest quarter quarter section. The Division also needs to have the total number of acres in the permit plus the number of Federal, State and fee acres. The Division is entitled to information listed above by R645-301-521.190.

Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-521.190, The Permittee must send the Division a legal description of the permit area. The legal description should describe all lands in the permit to the nearest quarter quarter section. The Permittee must also state how many acres in the permit area are Federal, State or private.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.12; R645-301-411.

Analysis:

Appendix 4-1 of the application contains information from three cultural resource surveys, including one done specifically for the proposed facilities area. There are several cultural resource sites in the vicinity, but only an isolated artifact was found in the proposed disturbed area. One site is listed on the National Register of Historic Places. It is a tree in Horse Canyon inscribed by Sam Gilson, a prominent rancher and promoter of the uses of gilsonite.

The information in the application is considered adequate; however, the maps and any other information that would allow a person to locate any of the sites should be kept confidential.

There are no cemeteries in or within 100 feet of the proposed addition to the permit area, and it contains no units of the National System of Trails or Wild and Scenic Rivers system.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations. Any information that would enable a person to locate any of the cultural resource sites should be made confidential.

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.18; R645-301-724.

Analysis:

The proposed mine site is in an area with an annual precipitation of approximately 12 inches, as described by Lines and others (1984).

The applicant has provided mean annual temperatures, however seasonal temperature have not.

Summer thunder storms are common to the area . Data for seasonal and monthly precipitation should be provided.

Findings:

R645-301-724, The applicant should provide seasonal and monthly records of precipitation data. The applicant should submit seasonal temperature data.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.19; R645-301-320.

Analysis:

Appendices 3-1 and 3-2 contain vegetation information about the Horse Canyon and "South Lease" areas. Additional information is in the existing Horse Canyon plan. These studies were done in 1981, 1982, 1983, 1985, and 1998. With the exceptions of a study by Patrick Collins in Appendix VIII-1 in the current Horse Canyon plan and a 1998 vegetation inventory in Appendix 3-2 of the application, the application does not show who conducted the studies as required in R645-301-120.

The 1998 vegetation inventory was site-specific to the proposed disturbed area and nearby proposed reference areas, and the following discussion concerns this report. Figure 1 in this study shows sampling locations in two vegetation communities, pinyon/juniper and shrub/grass.

There is inadequate information in the application for the Division to be able to determine whether the reference areas can be accepted. The Division requires that certain aspects of the reference area and proposed disturbed area be similar, including soils, vegetation cover, aspect, slope, species composition, and productivity. The vegetation study needs to include the entire area

proposed to be disturbed, and it also needs to include enough samples that the Division is assured the data adequately represents the community. Also, the application needs to contain enough information to make a statistical comparison between the proposed disturbed and reference areas.

Appendix A of the Vegetation Information Guidelines gives sampling methods that should be used for baseline vegetation inventories, and the minimum sample size for the sampling method used is the highest of either 15 or the number obtained from a formula in the guidelines. Achieving this sample size is required for bond release sampling and recommended for baseline sampling. Although the minimum sample size is not required for baseline sampling, there need to be enough samples that valid statistical analyses can be done on the data and that the Division can be assured there is enough data to quantify the vegetation resources. Meeting the minimum sample size in the guidelines would ensure adequate samples were taken.

The report says 1000 samples were taken in each vegetation type. According to the methodology described in the report, this is incorrect: each transect is considered a sample, not each point; therefore, only ten samples with 100 points in each were taken for the four different areas sampled. This could potentially be enough samples if:

1. The samples included the entire disturbed area, and,

2. The study contained enough statistical data to allow a comparison of the proposed disturbed area with the proposed reference areas.

The primary variable of concern is vegetation cover. (Lichens and cryptogams are not macrophytes and are not generally classified as "vegetation" in the context of the coal rules.) The report shows the number of "hits" on each species, which can be translated into percent cover, but it does not show the amount of cover in each transect. The amount of cover in each transect is needed to show the variabilities, standard deviations, and standard errors and to make statistical inferences.

The 1998 report in Appendix 3-2 says two-tailed t-tests with a two-sample equal variance were performed on each data set to determine similarity between the proposed disturbed areas and the reference areas. The report goes on to say there was a 95% similarity in species composition between the proposed disturbed and reference areas for the shrub/grass vegetation type and 96% similarity for the pinyon/juniper areas. While similarity of species composition is important in comparing the proposed disturbed and reference areas, there are other aspects that need to be compared, and vegetation cover needs to be compared statistically.

A regression comparison of the reference areas and the areas proposed to be disturbed may be appropriate as a type of similarity index, but it does not compare the primary parameter of concern which is vegetative cover. The application needs to show the vegetative cover values for the proposed disturbed and reference areas are statistically equal using a two-tailed t-test.

Where a species was not encountered in either the proposed disturbed or reference area for a community, it should not be used in the regression analysis. These "0-0" values tend to skew the data, and they invalidate the analysis.

Sampling in the proposed disturbed area was confined to the lower part of the area that would be disturbed; there are no samples in about two-thirds of the proposed disturbed area. The entire shrub/grass community may have been included in the sampling protocol since it appears from Plate 3-2 that the shrub/grass community is confined to the northwest portion of the proposed disturbed area. However, since Figure 1 shows neither the vegetation community boundaries nor the boundary of the proposed disturbed area, it is impossible to make this determination.

It does not appear the entire pinyon/juniper area was included in the area sampled. Samples in this vegetation type were confined to about one-third of the proposed disturbed area that would be in this community according to Figure 1 and Plate 3-2. The chance of this happening with randomly placed transects is about one in sixty thousand.

The Division is not confident the samples truly represent the pinyon/juniper community of the proposed disturbed area. A Division representative visited the site in June 1999 and was able to list over twice as many species as are shown in the vegetation report. Also, the soils and topography changes in certain areas and changes in the vegetation would not be reflected in the report. It is for these reasons that additional sampling needs to be done in the proposed disturbed pinyon juniper community.

Table 3 in the report in Appendix 3-2 is titled "Vegetation Inventory for Shrub/Grass and Pinyon/Juniper Areas," and it has subheadings "Disturbed Area" and "Reference Area." This is confusing: Is the information for the shrub/grass or for the pinyon/juniper community or for some combination? Since Table 4 on the next page shows vegetation cover for pinyon/juniper areas, it appears the information in Table 3 is for the shrub/grass community.

The comments in this review about the analyses for species composition also apply to the comparisons of woody species. However, woody species densities appear to be more different between the proposed disturbed and reference areas than the cover values. The Division needs more information before it will be able to decide whether these differences can be accepted.

Vegetative cover in the proposed disturbed pinyon/juniper community was 19.7%, and it was 24.3% in the proposed reference area. Predominant species were Utah juniper, Salina wild rye, pinyon, and green rabbitbrush. No cheatgrass was encountered.

Cover values were 43.0% and 42.7% for the proposed disturbed and proposed reference areas in the shrub/grass community. Species composition consisted primarily of cheatgrass, green rabbitbrush, and Salina wild rye. Cheatgrass or downy brome, an exotic annual, provided about 41% and 38% relative cover for the proposed disturbed and reference areas, respectively. The amount of cheatgrass indicates there has been previous disturbance, possibly from fire.

The 1998 vegetation study indicates cover from lichens was 7.2% in the shrub/grass community and 7.9% in the pinyon/juniper community of the proposed disturbed area. While lichens are not classified as vegetation, they can be an important part of the ecosystem and can contribute to vegetation productivity and erosion control. The proposed grass/shrub and pinyon/juniper reference areas had 5.8% and 2.7% cover from lichens, respectively.

The 1998 vegetation study in Appendix 3-2 indicates a Ferocactus sp. was found in the shrub/grass proposed disturbed and reference areas. The only species of Ferocactus listed in A Utah Flora grows in limestone and dolomite outcrops and gravels in Washington County. It would be very unusual to find this species in Emery county.

Another anomaly identified as being in the area is Engelmann spruce. A Utah Flora indicates this species has been collected from elevations as low as 7500 feet, but the mine site is at about 6000 feet. When additional vegetation data is collected, the applicant or its representative should check the identification of the plants classified as Engelmann spruce.

The information in the other vegetation studies in Appendix 3-2 is useful for its description of vegetation resources in the general area. The vegetation communities described in this appendix correspond generally to the communities shown on Plate 3-2 but do not match exactly. Major vegetation communities in the proposed addition to the permit area are pinyon/juniper, sagebrush, and saltbush/wild rye. Plate 3-2 also shows a fairly significant escarpment area, and it is assumed this area has little vegetation.

The application is required to contain productivity estimates for the area proposed to be disturbed and associated reference areas (if that is the method to be used to determine revegetation success). Appendix 3-7 contains a letter from George Cook of the Natural Resources Conservation Service with productivity estimates for two shadscale/grass and for two grass/shrub communities. It is unclear from the letter where these estimates were done. Most of the proposed facilities area has a pinyon/juniper community, but there is no productivity estimate for a pinyon/juniper community.

The Division has received a letter from Mr. Cook, now retired from the NRCS, giving production estimates for the grass/shrub reference area, the pinyon juniper proposed disturbed area, and the pinyon/juniper reference area. It does not show productivity information for the grass/shrub proposed disturbed area. All of this productivity information needs to be included in the application. The application also needs to contain copies of the data sheets for the productivity estimates and site ratings.

Mr. Cook rated the three areas as being in good range condition, but it is unusual for an area with 38% relative cover from cheatgrass to be considered in good range condition. There are a few possible explanations for this. One is that although cover from cheatgrass was high, production may have been low, and production is the parameter used in range condition assessments. The other possible explanation is that the cover and range condition estimates were done in different years, and the condition could have changed.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-131, All technical data submitted in the permit application must be accompanied by the names of persons or organizations that collected and analyzed the data, dates of the collection and analysis of the data, and

descriptions of the methodology used to collect and analyze the data. This information is not complete for some studies in Appendices 3-1 and 3-2.

R645-301-321, The applicant needs to provide vegetation information adequate to statistically compare the area that would be disturbed with a reference area or range site or adequate to use as a baseline success standard. This includes an adequate number of samples to compare proposed disturbed and reference areas statistically. The entire proposed disturbed area needs to be included in the sample. In addition, the applicant should provide a discussion of other aspects important in comparing the proposed disturbed and reference areas, such as slope, aspect, and soils.

R645-301-321, The applicant needs to check plants identified as Ferocactus sp. and Engelmann spruce. If the identifications are correct, the plants would be state records for elevation and range.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21; R645-301-322.

Section 322.220 and Plate 3-1 contain wildlife information. The proposed disturbed area contains critical winter range for mule deer and elk and habitat for Rocky Mountain bighorn sheep. Nearby areas are inhabited by pronghorns. The text discusses the types of habitats where these species occur and certain aspects of their life histories.

Raptor surveys were conducted in the area in 1990, 1998, and 1999. Plate 3-2 shows locations of three nests in or near Lila Canyon, and Appendix 3-5 contains further information, including two maps showing nest locations. Wildlife Resources commented that the 1998 raptor survey documented three nests at the mouth of Lila Canyon. It is assumed that other nests previously found in this area could not be found in 1998.

The text says results of the 1999 raptor survey are in Appendix 3-5, but these results are apparently not in the application. Section 323.300 says an active nest was found in the 1999 survey in the left fork of Lila Canyon within the one mile buffer zone. Because different nests have been identified in this area, it is not known which nest was active.

It is impossible to tell how the nest locations shown on the three maps in the application correlate. Only one of the nests shown on Plate 3-1 appears to be in the same location as a nest shown on the 1998 survey map included in Appendix 3-5. The other two nests appear to be in different locations. However, this is unclear because Plate 3-1 does not give enough detail of the topography.

The text mentions a prairie falcon scrape found in the east half of section 9, but it is not shown on any of the maps. Although it appears the mine would probably not affect this scrape, the application should show where it is since the text mentions it.

The applicant needs to include all available information about raptor use of the area, including locations of nest sites and whether they were used in the year surveyed. Because of the difficulty using the current maps, it is preferred that nest locations be shown on a single map.

The maps in the application showing raptor information are not acceptable for the following reasons:

1. Plate 3-1 does not show all of the raptor nests shown on maps in Appendix 3-5. It does not include contours that would allow the Division to better determine whether the mine would be visible from the nests. It also needs to show the location of the proposed disturbed area in relation to the nest sites.

2. The map in Appendix 3-5 labeled "Lila Point" includes contours, but it does not include all nests apparently within the area. Also, it does not show the location of the proposed surface facilities, and, even if it did, the scale is such that it would be difficult to make accurate measurements to assess how far the nests are from the facilities. (With this map and the one discussed below, there is no scale, but one can determine the approximate scale using section lines. The scale is about 1"=2500'.)

3. The markings on the map at the end of Appendix 3-5 are mostly illegible, and there is no legend to indicate what the marks represent. It appears this map is from an earlier raptor survey, possibly 1990, but this is not clear. Assuming the marks represent nest sites, it is not possible to determine how far they are from the proposed surface facilities because the surface facilities are not shown on the map and because the map is of such a large scale that it would be difficult to make accurate measurements.

Additionally, the maps showing raptor nest locations need to include an overlay of the mine workings. With this information, the Division and applicant can tell which nests may be affected by subsidence. This requirement is supported by R645-301-322.100.

According to Section 322.220, the entire permit area plus an area within 1 mile of the proposed surface facilities were surveyed for raptor nests.

The applicant commits to conduct raptor surveys one year prior to all purposed (assume proposed) new construction or potentially disruptive mining activity. This should be done in all suitable habitat within a one mile radius of these activities.

The discussion in the application concerning the disposition of raptor nests is not adequate. The application says an active golden eagle nest was found in the left fork of Lila Canyon in the 1999 survey and that consultation with the Fish and Wildlife Service is scheduled for the fall of 1999. Line of site and potential mitigation will be discussed at that time.

Portions of the facilities area are within the one-half-mile buffer zone for at least two and possibly as many as seven raptor nests (it is impossible to tell because of the difficulties discussed above). From the maps, it is clear that the mine would be visible from at least two of these nests, but the application needs to discuss the disposition of all of these nests–whether or not they have recently been active-- and indicate whether the facilities area would be visible from them. This is information

that should be available before consulting with the Fish and Wildlife Service. The applicant will need to coordinate its monitoring of these nests with the Division, the Fish and Wildlife Service, and the Division of Wildlife Resources.

Since the intermittent stream channels lack riparian vegetation, many birds of high federal interest would not inhabit the area.

In addition to this information, the application references a Division of Wildlife Resources publication entitled "Fauna of Southeastern Utah and Life Requisites Regrading their Ecosystems." This publication is available to the Division, and it contains general information about species that inhabit the area.

Threatened and Endangered Species

Table 3-1 lists eight listed threatened or endangered species the application says may occur in Emery county or that could be affected by the mine. Appendix 3-3 contains a letter from the Fish and Wildlife Service listing threatened and endangered species that occur in Emery county.

The Division received comments from the Fish and Wildlife Service dated April 14, 1999, indicating the listed endangered southwestern willow flycatcher is now included as a species potentially in Emery county. The Fish and Wildlife Service letter says, and the Division agrees, Table 3-1 needs to either include a complete list of species that could occur in Emery county or it needs to be eliminated and the application reference Appendix 3-3 for a list of species. In the latter case, the application needs to specifically mention that the southwestern willow flycatcher may also have potential of being in Emery county.

The possibility of each species on the Fish and Wildlife Service list occurring in the proposed addition to the permit area or being affected by the mine is addressed in the following discussion.

The Fish and Wildlife Service commented that the applicant needs to assess vegetation in the proposed addition to the permit area to determine whether southwestern willow flycatcher habitat exists. According to their letter, breeding habitat is typified by areas of dense willow or willow mixed with a variety of riparian shrubs and small trees.

The proposed addition to the permit area does not contain habitat for southwestern willow flycatchers. The application documents there are no perennial water sources or riparian areas in either the current permit area or the proposed addition, and according to verbal information from the applicant's consultant, there are few, if any, willows or similar riparian-type vegetation associated with the seeps and springs in the proposed addition to the permit area. There may have been a few willows or shrubs, but there were no dense patches as would be required by southwestern willow flycatchers.

The application needs to contain a discussion similar to the preceding paragraph discussing the likelihood of southwestern willow flycatcher habitat being in the proposed addition to the permit area. Although the application says there are no riparian areas or streams, it needs to discuss other areas, such as those around seeps and springs, that could potentially contain this habitat.

Bald eagles are fairly common winter residents of Utah, and they could visit the area. However, they generally like to roost in large trees that do not exist in the proposed disturbed area. Therefore, it is unlikely they will be adversely affected.

Peregrine falcons have recently been found nesting in a few places in the Book Cliffs and Wasatch Plateau although raptor surveys have failed to locate them in the proposed addition to the permit area. The applicant will need to continue to look for them in future raptor surveys. Peregrine falcons are no longer listed as threatened or endangered.

Four fish species of the Upper Colorado River drainage have been listed as threatened or endangered, and although the mine would not affect them directly, water usage has been determined to adversely affect these species. As discussed in the fish and wildlife protection part of this review, the mine is expected to use about 21.3 acre-feet of water annually, including water lost through mine ventilation. Mitigation is required when the annual depletion exceeds 100 acre-feet.

Black-footed ferrets have historically been found in eastern Utah, but there have been no confirmed sightings in recent years. If any were in the area, it is most likely they would be affected by road construction.

(Information in the following discussion on the distribution of plants is from A Utah Flora or is verbal information from Bob Thompson, a botanist with the Forest Service.)

Barneby reed-mustard (Schoencrambe barnebyi) grows at elevations of about 5600 to 5700 feet on the Chinle formation. The proposed disturbed area is at a higher elevation, and it does not contain the Chinle formation. Therefore, the area is not considered habitat for this species.

The reported elevation range for Jones cycladenia (Cycladenia humilis Var. jonesii) overlaps the proposed disturbed area, but it grows in sandy gypsiferous soils derived from the Cutler, Summerville, and Chinle formations, and these are not found in the proposed addition to the permit area.

Last chance Townsendia (Townsendia aprica) grows in salt desert shrub and pinyon-juniper communities on clay or clay-silt exposures of the Mancos Shale. It has been found mainly in the Fremont Junction area and not on the east side of the San Rafael Swell.

The Maguire daisy (Erigeron maguirei) has only been found in a few places in the San Rafael Swell and in Capitol Reef National Park in canyon bottoms in the Wingate and Navajo Sandstone formations. There is essentially no possibility this species could occur in the proposed addition to the permit area.

Three cactus species are included on the Fish and Wildlife Service list. The San Rafael cactus or Despain footcactus (Pediocactus despainii) is very difficult to find and grows in open pinyon/juniper communities in and on the edges of the San Rafael Swell. This is the type of habitat in the proposed disturbed area, and, according to Bob Thompson of the Forest Service, there is potential this species could occur in the area.

According to Mr. Thompson, the Wright fishhook cactus (Sclerocactus wrightiae) also has potential of occurring in the area. It grows in salt desert shrub and shrub/grass to juniper communities in soil derived from Mancos Shale and other formations.

It is understood the applicant's consultant searched for the Despain footcactus and Wright fishhook cactus and did not find them. This needs to be documented in the application together with information about when the search was performed and who did it. The July 29, 1999, letter from Environmental Industrial Services in Appendix 3-4 does not give this information.

The Winkler cactus (Pediocactus winkleri) is a tiny plant that grows in salt desert shrub communities at lower elevations than those in the proposed disturbed area. Its distribution is more to the west, and it is unlikely it occurs in the proposed addition to the permit area.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

R645-301-322, The Fish and Wildlife Service commented, and the Division agrees, that Table 3-1 either needs a complete listing of threatened and endangered species that occur in Emery county or it needs to be eliminated. If eliminated, the application should mention the Fish and Wildlife Service believes there is potential habitat for the southwestern willow flycatcher in Emery county.

R645-301-322, The applicant needs to confirm whether habitat for the southwestern willow flycatcher exists in the proposed addition to the permit area. While there is no indication this habitat is present, and while this is discussed in this analysis, the application needs to contain this documentation.

R645-301-322, The maps showing wildlife habitat need to contain the information provided on USGS 1:24,000 scale maps, including contours. At least one of the maps showing raptor nests should show the area of the proposed facilities, and information on nest locations should be consolidated onto one map. The map(s) need(s) to be of a small enough scale that the Division can make accurate measurements. Also, a map needs to include an overlay of the mine workings to better show which nests could be affected by subsidence.

R645-301-322, The application needs to discuss the raptor nests near the proposed facilities area and show whether they are visible from the mine or if they are shielded by vegetation or topography. It also needs to discuss potential effects from the proposed mine.

R645-301-322, It appears the applicant's consultant searched for and did not find Despain footcactus (Pediocactus despainii) and the Wright fishhook cactus (Sclerocactus wrightiae) in the proposed disturbed area. This needs to be documented in the application.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.21, 817.200(c); R645-301-411, -301-220.

Analysis:

Chapter 2, Soils, Sections 210 through 224, discusses the soil resources within the proposed Lila Canyon Mine. Relevant soils information includes prime farmland investigation, current and published soil surveys, soil characterizations, and substitute topsoil identification. The Analysis section discusses resource information as follows:

- Prime Farmland Investigation
- Soil Survey Information
- Soil Characterization
- Substitute Topsoil

Soil Survey Information

The soil survey information contains both general and site specific surveys as follows:

General, Third Order Soil Survey

Appendix 2-2 and Soils Map 2-1 make up the general Order 3 soil survey. The unpublished Order 3 soil survey for Emery County is currently in progress by the U. S. Department of Agriculture, Natural Resource Conservation Service (NRCS). Portions of the Order 3 soil survey relevant to the Lila Canyon Mine project has been provided by the NRCS. The soil map (Plate 2-1) is scaled at 1:24,000 and includes map unit descriptions.

The Order 3 soil survey information provided by the NRCS identifies four soil mapping units located within the mine surface facilities area as:

- BNE2 Strych very bouldery, fine sandy loam, 3 to 20 % slopes
- BMD Strych very stony fine sandy loam, 3 to 30 % slopes
- NGG2 Gerst-Strych-Badland complex, 30 to 70 % slopes
- RZH Rock Outcrop-Atchee-Rubbleland Complex

In addition, the Order 3 soil survey (Appendix 2-2) and soil map (Plate 2-1) provide identities and information on the following soil mapping units as located within Permit Area "B" for Lila Canyon boundary as follows:

2.	DHG2	Comodore-Datino Complex
3.	DSG 2 (HUG)	Midfork-Tingey-Comodore Complex
4.	GNA	Neto fine sandy loam
5.	KXH	Podo-Rock outcrop Complex
6.	MHE (MSC)	Podo sandy loam, 1 to 8 percent slopes
7.	MRG	Vassilla-Rock outcrop-Gerst Association
8.	MTH	Cabba-Guben-Rock outcrop Complex

9.	MUE	Cabba-Podo-Doney Complex
10.	NGG2	Gerst-Strych-Badland Complex
11.	NVF2	Gerst-Rubbleland-Badland
12.	NXC	Lazear-Rock outcrop Complex, high rainfall
13.	RR	Rock outcrop
14.	RWG	Rock outcrop-Rubbleland-Vassilla Complex
15.	RZH**	Rock outcrop-Atchee-Rubbleland Complex
16.	UMF2	Guben-Pathead-Rabbitex Association
17.	VOH	Guben-Rock outcrop Complex

**Appendix 2-2 does not contain information for the RZH soil.

Appendix 2-2 also provides typical soil pedon and soil descriptions for the following Soil Series:

Atchee, Cabba, Comodore, Datino, Doney, Gerst, Guben, Lazear, Midfork, Neto, Pathead, Pinon, Podo, Rabbitex, Strych, Tingey, and Travessilla.

Site specific, First Order Soil Surveys

In August 1998, a site specific Order 1 soil survey for the surface facilities area was performed and prepared by Mr. Daniel Larsen, Soil Scientist, Environmental Industrial Services (Appendix 2-3). The survey contains soil descriptions, soil pedon descriptions, soil salvage suitability analysis, laboratory soil testing data, field soil profile descriptions, soil and landscape photographs, soils map, and salvageable soils map. The detailed soil survey of the surface facilities site identifies six soil map units as follows:

- SBG Strych boulder fine sandy loam, 5 to 15 % slopes
- VBJ Strych very bouldery fine sandy loam, 5 to 15 % slopes
- XBS Strych extremely bouldery sandy loam, 10 to 45 % slopes
- RBL Rubbleland-Strych-Gerst complex, 20 to 70 % slopes
- DSH Strych fine sandy loam variant, 3 to 8 % slopes
- RBT Rock outcrop - Travessilla family complex

All mapping and soil survey work were performed according to the standards of the National Cooperative Soil Survey. Based on the site-specific soil descriptions, and laboratory data, each of the soils were classified according to current, unpublished NRCS soil taxonomy, and correlated to specific soil series names. The RBT soil unit references the Travessilla family complex; however, the Travessilla family has been revised by NRCS and based on changes, the Atchee series is more appropriate to Map Unit RBT (Based on personal conversation to Dan Larsen with Leland Sassar, July 1999). The Order 1 soil survey map has discontinuous 25 feet contour lines within the surface disturbance area.

Soil productivity of existing soils was determined by Mr. George Cook from the Natural Resources Conservation Services and results are shown in Appendix 3-7.

An addendum has been attached to Appendix 2-3 to include the Lila Canyon Mine, proposed portal fan site soil evaluation. Two soil descriptions were taken at the site and include pits LC11 and LC12. Rating of soil suitability criteria shows good ratings, except for water holding capacity with a poor rating. Average depth of soil is about 15 inches, with a range of about three feet to zero. The deeper soils are at the upper edge of the bench which grade to bedrock sandstone at the lower edge. Soils are derived primarily from colluvial materials.

Soil Characterization

Soil pedons were characterized by the soil horizons at each sampling location. All profile descriptions were recorded on standard NRCS forms and are provided in Appendix D within Appendix 2-3. The soil horizons at each sampling location were sampled and characterized according to the State of Utah Division of Oil, Gas and Mining (DOGM) guidelines for topsoil and overburden[1]. Sampled parameters included: soil texture; pH; organic matter percent; saturation percent; electrical conductivity; CaCO3; soluble potassium, magnesium, calcium and sodium; sodium absorption ratio, and extractable selenium and boron. Available water capacity, alkalinity, total nitrogen and available phosphorus were not analyzed at this time; these parameters can be tested at reclamation time. Organic matter percent was substituted for organic carbon. Soil texture by hand-texture method, rock fragment content (% by volume), and Munsell color were determined in the field by Mr Larsen. Generalized soil properties, including percent surface stones and boulders, are summarized as follows for each soil type:

Map Unit	%Surface Stones & boulders	Soil Depth	% Slope	Permeability	Water Erosion Potential
SBG	3-8	Very Deep >60"	5-15	Moderate to Moderately rapid	Moderate low
VBJ	8-20	Very Deep >60"	5-15	Moderately rapid	Moderate low
XBS	20-40	Very Deep >60"	10-45	Moderately rapid	Low to moderate
DSH	<2	Very Deep >60"	3-8	Moderately rapid	Moderate
RBL	>50	Shallow to Deep	20-70	Slow to moderately rapid	Severe on shale, Low on rock
RBT	>50	Shallow	30-100	Slow to moderately rapid	Severe to Low

[1]Leatherwood, J., and Duce, D., 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.

Soil samples were sent to Inter-Mountain Laboratories, Inc. for analysis. Appendix C of Appendix 2-3 contains the laboratory data sheets for all analysis on the 22 samples and duplicate analysis. Overall, soil laboratory test results show a good rating for soil materials, except as noted below:

- pH was high (rated poor) in only one sample - LC3, 24-48" with pH 8.6. Sample LC4, 40-58" had a pH of 8.2, which is rated fair to good. All other samples tested from pH 7.1 to 8.0 for a good rating.

- Electrical Conductivity and SAR were high in samples LC3 48-55" and LC5 40-58". For sample LC3 48-55", the SAR was 18 with an EC of 2.48. Since the SAR is greater than 15, soil materials below 48 inches are considered unacceptable. For sample LC5 40-58", the SAR measured 15 with an EC value of 8.89 mmhos/cm. The SAR is rated unacceptable for coarse textured soils and the EC is rated poor; therefore, soil materials below 40 inches are considered marginal at best.

  Sample LC10 0-4" had an EC of 2.58 mmhos/cm which has a rating of fair. All other samples had EC values ranging from 0.29 to 4.0 mmhos/cm, which is rated as good.

- Soil textures classified as sandy loam, except for samples LC1 3-10" and LC10 0-4" which were sandy clay loam and silt loam respectively. Based on soil texture, all soils tested are rated as good for reclamation material.

- Available water holding capacity values ranged from good to poor. The majority of samples were rated as fair; with LC1 0-3" rated poor; and LC1 10-23", LC5 29-40", LC5 40-58", and LC6 5-18" rated good.

- Soluble boron tested at less than 5.0 mg/kg on all samples, resulting in a good rating.

- Extractable selenium content tested at 0.2 mg/kg or less, which is considered good since all readings are less than 0.10 mg/kg.

- Organic matter content is relatively low in these soils. Generally, the surface soils ranged between 1.0 to 1.5 percent organic matter and the subsoils were about 0.5 percent.

- A calcic horizon was verified in soil pedons LC1, LC5 and LC6 with $CaCO_3$ ranging between 20 to 21 percent. Pedons LC3 and LC4 have some $CaCO_3$ accumulation in the subsoil but is less than the 15 percent needed to be classified as a calcic horizon.

- Soluble magnesium exceeded soluble calcium below depths of 30 inches. In general for these samples, the soluble calcium decreases and magnesium increases with depth.

  Normally, higher ratios of calcium to magnesium exist in soil solutions. Calcium is retained much more readily than magnesium on soil colloid exchange sites, resulting in the total amount of calcium in soils exceeding that of magnesium. However, the cross-over can occur were calcium is being removed from the soil solution by calcium carbonate precipitation,

which explains the higher magnesium level in the lower soil horizons containing higher levels of calcium carbonate.

- Every effort should be made to minimize mixing the deeper subsoils containing extremely higher rock content with the surface soils and shallow subsoils containing lower amounts of rock. The percent rock content within the mine site disturbance or proposed facilities area is the main deterrent for soil suitability based on the current DOGM guidelines. Although DOGM suitability criteria considers >30% (by volume) rock fragments (for both gravels <3" in size and cobbles 3 to 10" in size) to be unacceptable, and >10% stones and boulders >10" in size to also be unacceptable, the recent trend by DOGM is to salvage native soils with intrinsic or indigenous rock content. Appendix 2-3 reports that native soils can be salvaged containing a higher rock content than the DOGM guidelines deems acceptable. Using these natural rocky soils should enhance reclamation success by providing an environment similar to native conditions. However, higher rock content greater than is present in the surface soils needs to be avoided. Natural, intrinsic rock content provides for a more stable reclaimed surface, aids in water harvesting and water holding capacity of interstitial soils, and creates wildlife habitat and niches on the surface were surface boulders and larger cobble sized rocks are placed.

Substitute Topsoil

The PAP does not propose any borrow as a source for substitute topsoil.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. The applicant must provide the following in accordance with:

R645-301-222 through R645-301-222.300, Appendix 2-2 does not contain information for the RZH soil map unit which is shown on the general Order 3 soil map 2-1 as located within the Permit Area "B" for Lila Canyon boundary.

R645-301-141, The Order 1 soil survey map, both in Appendix 2-3 and on Plate 2-2, and the Salvageable Soils Map, Appendix A2 of Appendix 2-3, have discontinuous 25 feet contour lines within the surface disturbance area. Present this map with continuous contour lines.

LAND-USE RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.22; R645-301-411.

Analysis:

Premining land uses of the proposed addition to the permit area include grazing, wildlife habitat, coal mining, and limited recreation. Grazing allotment boundaries are show on Plate 4-2, and

wildlife habitat is show on Plate 3-1. Production in the grazing allotments in terms of animal unit months is shown in Table 4-3.

In Section 410, the application says there are no agricultural activities in the permit area other than grazing, but Section 411.110 says no agricultural activities have been or are currently being performed in the permit area. Grazing is an agricultural activity, so the statement in Section 411.110 needs to be modified.

According to the application, Lila Canyon is within an area identified by the Bureau of Land Management as the Range Valley Mountain Habitat Management Plan Area. A habitat management plan was adopted in 1991 to provide management for various wildlife and for access management.

The proposed addition to the permit area does not support a wide variety of land uses because of the limited access and remote location, rugged topography, limited soils, and lack of rainfall and surface water. Water rights are discussed in Chapter 7, and water uses include stock watering and various uses for coal mining.

The land is zoned by Emery County for mining and grazing. A small portion of the proposed permit area addition overlaps with the Turtle Canyon Wilderness Study Area.

The Bureau of Land Management's 1999 Utah Wilderness Inventory identifies areas with wilderness character in addition to the previously-identified wilderness study areas. One of these areas overlaps the proposed addition to the permit area and is very close to, and may even overlap, the proposed disturbed area. The application says the land management policy has not changed for these areas during the EIS process.

The application needs to contain documentation of the current management strategy for the areas recently added as wilderness study areas. This information may not yet be available, but it needs to be included in the application as soon as possible. The Internet site shown in the application does not discuss how the areas will be managed. The application contains a copy of the 1993 environmental assessment prepared for management of the Turtle Canyon Wilderness Study Area, and it says underground mining would be acceptable in this area. However, there is no information about what activities will be allowed by the Bureau of Land Management in the new areas.

There has been some previous mining activity in Lila Canyon, but it is unknown how much coal was mined. The road on the bottom of Lila Canyon was built in the 1950's to provide access for coal exploration. There is a sealed portal in the left fork of the canyon where the Sunnyside Seam was exposed and coal mined, and the coal was probably transported back through the Horse Canyon Mine. It is believed mining occurred during the 1970's or early 1980's. If mining occurred during this time period, it should have been regulated under Title V of SMCRA.

Table 4-2 itemizes acreage figures in both the current Horse Canyon permit area and the proposed addition to the permit area. Section 411.130 says all of the 9320 acres within the permit area are managed by the Bureau of Land Management, and it says 910 acres are privately owned and 800 acres are owned by the State of Utah. These figures in Section 411.130 are inconsistent with those shown in Table 4-2. A deficiency under R645-301-114 addresses this problem.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

R645-301-411, In one section, the application says there are no agricultural activities within the proposed addition to the permit area; however, grazing is considered an agricultural activity. This needs to be corrected.

R645-301-411, The Bureau of Land management's 1999 Utah Wilderness Inventory indicates part of the proposed addition to the permit area has wilderness characteristics, including land immediately adjacent to and possibly overlapping the proposed disturbed area. The application needs to provide documentation of the Bureau of Land Management's management plans for the area.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 785.19; R645-302-320.

Analysis:

An assessment of the permits area by the regulatory authority concludes, there are no alluvial valley floors that could be affected by mining. The premining land use is undeveloped rangeland which is not significant to farming; There is no farming activity upstream or downstream of the pemit area, therefore, the proposed operations will not interrupt, discontinue, or preclude farming on an alluvial valley floor. The only potential of subirrigation is in very small area along upper perennial reaches of Little Park Wash , however these areas are very small with no chance of farming activities taking place..

Findings:

A determination of no alluvial valley floors exists in or adjacent to the permit area that can be impacted by mining operations.

PRIME FARMLAND

Regulatory Reference: 30 CFR Sec. 785.16, 823; R645-301-221, -302-270.

Analysis:

A Prime Farmland site investigation was performed by the Natural Resources Conservation Service (NRCS). A determination was made that no Prime Farmland or farmland of statewide importance were found within the proposed Lila Canyon coal lease area and support facilities area

because there is no developed irrigation system on arid soils. The determination letter from the NRCS dated June 8, 1998, was sent to Environmental Industrial Services and is included in Appendix 2-1.

Findings:

The applicant meets the minimum requirements of this section.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.22; R645-301-623, -301-724.

Analysis:

Geologic information includes a description of the geology of the proposed permit and adjacent areas down to and including the stratum immediately below the lowest coal seam to be mined. The coal seams and adjacent strata comprise an aquifer that may be adversely impacted by mining. Geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water.

The application does not include geologic information in sufficient detail to assist in determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary, and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The information is not sufficient to assist in determining all potentially acid- or toxic-forming strata down to and including the stratum immediately below the coal seam to be mined and determining whether reclamation can be accomplished. Geologic information is not sufficient to assist in preparing the subsidence control plan.

Required resource maps and plans and detailed site specific information are based on published geologic information, permit applications of the adjacent Sunnyside and South Lease areas, and drilling records of U. S. Steel Corporation and the Los Angles Department of Power and Water. Some of these are included in the PAP, others are readily available, but some of the information is proprietary or otherwise not readily available to the Division and public.

Strata above the coal seam to be mined will not be removed, so samples have been collected and analyzed from test borings or drill cores. Bore holes S-1 through S-23 were drilled between 1948 and 1975. S-24 through S-31 were drilled in 1980 and 1981, and an unsuccessful attempt was made to convert S-26, S-28, and S-31 to ground-water observation wells.

S-26 and S-31, located south of the Williams Draw Fault, were offset with shallow piezometers A-26 and A-31 to observe ground water in the alluvium (Table 6-3). Table VI-3 does not indicate that these wells have been plugged and abandoned; however, the applicant has no data on A-26 and A-31 (Section 6.5.1, p. 21) and considers these sites unusable (Section 724.100).

S-32 was drilled in 1981 and completed as a piezometer in the Grassy Member of the Blackhawk Formation. The location of S-32 is not shown on any map: it can be determined from the log in Appendix 6-1 that it is in T. 17 S., R. 15 E. but the section cannot be identified. The applicant states that other than the log there are no other geologic or piezometric data from S-32 (Section 6.5.1, p. 21).

Two other wells were bored in Horse Canyon to monitor water in the alluvium. These two wells have since been sealed according to Section 724.100 (page 11) of the PAP; however, in Section 722.400 it states that one well will be used during mining and reclamation operations and sealed after reclamation is complete and that, to the applicant's best knowledge, the second well has already been sealed. There are no logs or other geologic or hydrologic data from these wells in the PAP.

In 1993 and 1994 IPA-1, IPA-2, and IPA-3 were drilled. Results of proximate and ash analyses of "floor" and "roof" from IPA-1, IPA-2 (roof only), and IPA-3 are in Appendix 6-2; however, the analyses reports show these are coal samples, not samples from strata overlying and underlying the coal seam. There are also proximate, ultimate, sulfur (total and pyritic), ash, and several other analyses for "middle" coal samples from the three bore holes.

Logs of bore holes IPA-1, IPA-2, IPA-3, S-14, S-27, and S-32 are in Appendix 6-1. Ground water was noted on the logs for IPA -1 and IPA-2: fluid levels were reported for S-27 and S-32 but the fluid may have been static drilling fluid in the bore hole rather than ground water. These logs show lithologic characteristics, including physical properties and thickness of each stratum that may be impacted. In addition to the bore holes, coal seams and adjacent strata were measured at seventeen out-crop locations in 1974 and 1975. Lithology and thickness of the coal seams and adjacent strata, based on the bore holes and measured out-crop sections, are shown on Plate 6-5.

Engineering properties of the strata immediately above and below the coal seam to be mined are listed in Table 6-6. Data are based on core samples from bore holes S-18 and S-22.

Access to the underground workings of the Lila Canyon Mine will be provided by two rock slopes driven up-dip from the top of the Mancos Shale to the coal seam. Rock that will be removed from the tunnels will be called "slope rock", and it fits most closely into the classification of underground development waste. The slope-rock underground development waste will contain mostly shale, sandstone, and mudstone. Traces of coal may be found, but the applicant feels the amount will be insignificant. Slope-rock will be used to fill in areas to be used as pads in the coal pile storage areas, with any additional being placed in the refuse pile, or it may be crushed and used for gravel (Section 528.320), although the use for the gravel is not described.

Coal processing waste from the crusher will be placed in disposal areas within the permit area. The refuse pile has been designed as a location for the storage of underground development waste that is brought to the surface, including any excess slope-rock not used as fill; it is not anticipated that any underground waste other than the slope-rock will be brought to the surface. The capacity of the pile is designed for 150,000 tons, which is in excess of projected needs. Material not transported to the surface, such as overcast material, rock falls, and slope material may be disposed of underground according to the appropriate MSHA regulations. Because this will be an underground mine there will be no spoil.

The slope-rock underground development waste will be left in place for final reclamation if tests indicate the material is satisfactory. If the material is not satisfactory, it will be handled as refuse; otherwise, the area will be covered and re-seeded as per Chapters 2 and 7 and PAP Section 540 . In 537.210 the applicant commits to test the slope-rock underground development waste to assure that the material is composed of nonacid- or nontoxic-forming waste.

The PAP contains no reports of analyses for acid- or toxic-forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined, including the rock through which the tunnels will be built, and it is not established that this material can be properly disposed of at the waste rock disposal area and that reclamation of the waste rock disposal site can be accomplished. The applicant contends that over 100-years of mining experience at the adjacent Sunnyside Mines indicates that none of the horizons contain acid- or toxic-forming materials in quantities sufficient to be considered a problem, but no data are presented to substantiate this claim.

The coal seam crops out at approximately 6,500 feet in the vicinity of the rock-slope tunnels. The PAP indicates the tunnels will intercept the coal seam at approximately 6,300 feet.

Underground mining always has a potential for impacting surface-water, ground-water, and other surface resources. The applicant states in Section 721 (page 6) that subsidence effects are expected to be minimal due to the amount of cover and massive rock strata between the mining and the surface. Coal-seam elevations determined from bore holes are on Plate 6-4 - Cover and Structure Map.

The applicant has made no request to the Division to waive in whole or in part the requirements of the borehole information or analysis required of this section.

Findings:

Geologic Resource Information is not considered adequate to meet the requirements of this section. Prior to approval the applicant must provide the following information:

R645-302.122, -624.130 - Outside sources are referenced many times but the outside sources are not adequately described or listed in a "reference" section.

R645-301-302.122, -624.130, -624.320 - The applicant asserts that over 100-years of mining experience at the adjacent Sunnyside Mines indicates that none of the horizons contain acid- or toxic-forming materials in quantities sufficient to be considered a problem, but no data are presented to substantiate this assertion.

R645-301-624.320 - There are no reports of chemical analyses for acid- or toxic-forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined, including the rock through which the tunnels will be built.

R645-301-624, -624.210 - Two wells were located in the alluvium in lower Horse Canyon Creek. It is not clear whether the well that is nearer the Horse Canyon

surface facilities has been sealed and abandoned (as indicated Section 724.100) or is operational and is to be used during mining and reclamation operations (as indicated in Section 722.400). There are no hydrologic data from either well in the PAP.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Sampling and analysis.

The surface-water monitoring point-source discharge monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Environmental Health for Utah Pollutant Discharge Elimination System (U.P.D.E.S.) permits. A U.P.D.E.S. discharge permit application has been submitted to the Division of Environmental Health for the proposed sediment pond and mine water for the Lila Canyon operation. Existing U.P.D.E.S. permit applications for the Lila Canyon Mine are provided in Appendix 7-5. parameters are shown in Table 7-4. Water monitoring locations and sample frequencies are described in Table 7-3 and on Plate 7-4 .

As indicated in Section 731.220, surface-water monitoring data will be submitted at least every 3 months for each monitoring location. When analysis of any surface water sample indicates non-compliance with the permit conditions, the company will promptly notify the Division and immediately take actions to identify the source of the problem, correct the problem and, if necessary, to provide warning to any person whose health and safety is in imminent danger due to the non-compliance.

All water-quality analyses performed to meet the requirements of R645-301-723 through -724.300, -724.500, -725 through -731, and -731.210 through -731.223 will be conducted according to the methodology in the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434. Water-quality sampling will be conducted according to either methodology listed above when feasible (Section 723).

Baseline information.

Within the permit area, the surface water resources consist of three main drainages: Horse Canyon Creek, an intermittent stream, Little Park Wash, an intermittent stream and Lila Canyon Creek, an intermittent stream. Horse Canyon flows to Icelander Wash which, in turn, flows to Grassy Trail Creek and the Price River. Little Park Wash flows southward to Trail Canyon and the Price River. Lila Canyon flows southwest to Grassy Wash, then south to the Marsh Flat Wash and the Price River. (See Plate 7-1)

Generally, Horse Canyon, Little Park and Lila Canyon Creeks flow during the spring snowmelt runoff period and also as a result of isolated summer thunderstorms. Due to the limited

drainage area and elevation of Lila Canyon, the duration of the snowmelt flows is quite short and is limited to the very early spring. Locations of all baseline data points are shown on Plate 7-1. Baseline data information is included in Appendix 7-1. There are no streams, lakes or ponds or irrigation ditches known to exist within the proposed permit or adjacent areas. By late spring to early summer, usually no flow is evident in Horse Canyon Creek, below the minesite or Lila Canyon Creek.

This will be an underground mine with approximately 39.81 acres of surface disturbance for mine site facilities and roads. Runoff from the disturbed minesite area is proposed to be controlled by a system of ditches and culverts which will convey all disturbed area runoff to a sediment pond for final treatment prior to discharge.

Based on results of the PHC determination, base-line study and other available information, numerous small springs and seeps exist within, and adjacent to, the permit area. In addition, ephemeral drainages in the area flow in response to snow melt and precipitation events. The proposed surface-water monitoring program will monitor the significant surface water sources, including drainages above and below the disturbed mine site area, and all point-source discharges (i.e. sediment pond). The U.S. Geological Survey conducted a water quality study in Horse Canyon from August 1978 until September 1979 during the time that U.S. Steel operated the mine. Samples were taken monthly from the Horse Canyon Creek and analyzed for most major ions and cations and field parameters. Metals, eight nitrogen species and other minor chemical constituents were taken on a quarterly basis or less. This is briefly mentioned in Appendix 7-3 but these data are not in the PAP and the results of the analyses are not discussed with the baseline information. There is no reference for the source of these data.

Between January 1981 and April 1983, baseline water quality data were collected for surface water and spring sites B-1, HC-1, RF-1 and RS-2 on the Horse Canyon permit area. Between 14 and 19 samples, depending on the site, were taken and analyzed during the monitoring period. The parameters that were analyzed were derived from Section 783.16 (apparently the number in the old Coal Mining Regulations). This is briefly mentioned in Appendix 7-3 but these data are not in the PAP and the results of the analyses are not discussed with the baseline information. There is no reference for the source of these data.

Two other sites, RS-1, and RS-2, were sampled once a year during 1978, 1979, and 1980 and analyzed for most major chemical constituents. In addition, springs H-6, H-18, and H-21 were sampled once and analyzed for the major constituents in 1985. Third quarter data for 1989 were collected for HC-1 and RF-1 and sampled for most of the parameters in UDOGM's guidelines. This monitoring is briefly mentioned in Appendix 7-3 but the data are not in the PAP and the results of the analyses are not discussed with the baseline information. There is no reference for the source of these data.

Ground-water information.

An unsuccessful attempt was made to convert bore-holes S-26, S-28, and S-31 to ground-water observation wells. S-26 and S-31, located south of the Williams Draw Fault, were offset with shallow piezometers A-26 and A-31 to observe ground water in the alluvium (Table 6-3); it is not clear from Table VI-3 whether or not these wells have been plugged and abandoned or if they are

available for ground-water monitoring; however, the applicant has no data on A-26 and A-31 (Section 6.5.1, p. 21) and considers these wells unusable (Section 724.100).

Two other wells were bored in Horse Canyon to monitor water in the alluvium there. These two wells have since been sealed according to Section 724.100 (page 11); however, in Section 722.400 it states that one well will be used during mining and reclamation operations and sealed after reclamation is complete but that, to the applicant's best knowledge, the second well has been sealed. There are no logs or other geologic or hydrologic data from these wells in the PAP.

S-32 was drilled in 1981 and completed as a piezometer in the Grassy Member of the Blackhawk Formation. Its location is not shown on PAP maps. The PAP contains no data on ground-water elevation or quality for S-32 and the applicant states that other than the logs in Appendix 6-2 there are no geologic or piezometric data from S-32 (Section 6.5.1, p. 21).

In 1993 and 1994, IPA-1, IPA-2, and IPA-3 were drilled. There are seasonal water-level measurements in the PAP for IPA-1, IPA-2, and IPA-3 for 1994, 1995, and 1996 but not for 1997, 1998, or 1999.

Locations of all known seeps and springs, as well as watering ponds and tanks, are shown on Plate 7-1 (Section 722.200).

JBR Consultants Group conducted a seep and spring survey of the Horse Canyon area in 1985. Table 7-1 in the PAP contains flow, pH, conductivity, and temperature data collected in 1985 for nineteen seeps and springs: H-1 through H-11, H-13, H-14, H-18 through H-22, and H-92. Laboratory report sheets for H-2, H-4, H-11, H-13, H-14, and H-18 for 1994 and 1995 and for H-1, H-6, H-10, and H-21 for November 1985 are in Appendix 7-6. H-7, H-8, H-9, H-10, H-11, H-13, H-14, H-18, H-19, H-20, H-21, and H-22 could not be found on Plate 7-1.

Springs identified by JBR Consultants Group as H-21A, H-21B, H-18A, and H-18B were shown on a preliminary Plate 7-1 but were not listed or discussed in the PAP: the applicant states that no sample data or pertinent information are available for these sites, so they are no longer on Plate 7-1 (Section 724.100, page 14). The applicant states that HC-1A is not on Plate 7-1 for the same reason; however, HC-1A is still on Plate 7-1.

Appendix 7-1 contains seasonal information on ground-water quality and flow for seeps and springs 1, 9, 10, 14, 16(16Z), HC-2, HC-4, HC-9, HC-11, HC-13, HC-14, HC-18, HCSW-1. Data are from work done in 1993, 1994, and 1995 by EarthFax Engineering for the Los Angles Department of Water and Power. Water-quality descriptions include total dissolved solids or specific conductance corrected to 25°C, pH, total iron, and total manganese. Most other parameters listed in UDOGM directive Tech 004 were determined in these samples; however, total hardness, total alkalinity, and acidity were not reported (bicarbonate and carbonate were reported). Total rather than dissolved concentrations were determined for all metals. Springs and seeps HC-2, HC-4, HC-9, HC-11, HC-13, HC-14, HC-18, and HCSW-1 could not be found on Plate 7-1.

EarthFax also identified springs and seeps 1A,1B, 2, 3, 3A, 3B, 3C, 3D, 4, 5, 6, 7, 8, 8A, 8B, 9R, 10A, 11, 12, 12A, 12B, 12C, 12D, 12E, 13, 13A, 13B, 13Z, 14A, 15, 15A, 15B, 15C, 16A, 16B, 16C, 17, 17A, 17B, 18, 19A, 19B, 19C, 20, 22, HCSW-2, and HCSW-3. These were dry or had low

flows at the time of the quarterly visits and no water-quality analyses were done. 8B, 15A, 17B, 18A, 19C, and HCSW-3 could not be found on Plate 7-1. Springs and seeps 8B, 15A,17B, 18A, 19C, and HCSW-3 could not be found on Plate 7-1.

Appendix 7-2 contains the 1997 Annual Hydrologic Monitoring Report for the Horse Canyon Mine with data for RS-2 (Redden Spring). The quarterly samples from this spring were analyzed for all Tech 004 parameters except total manganese and acidity.

Water rights are listed in Table 7-2. The list includes Redden Spring plus springs identified as Mont, Leslie, Cottonwood, Willows, Konna, and Pine. In addition there are eleven unnamed or otherwise unidentified springs listed, plus a well. Locations of water rights are on Plate 7-3, and some of the locations on Plate 7-3 correspond roughly with springs shown on Plate 7-1. A water right for a well is listed in Table 7-2, but information in other parts of the PAP indicate this was a water monitoring well.

Surface-water information.

Surface-water quality protection is proposed to be accomplished by the plan described in Section 731 and the following methods:

(1) Minimizing surface disturbance and proper handling of earth materials to minimize acidic, toxic or other harmful infiltration to ground-water systems;

(2) Testing (as-necessary) to ensure stockpiled materials are non-acid and non-toxic;

(3) Controlling and treating disturbed area runoff to prevent discharge of pollutants into surface-water, by the use of diversions, culverts, silt fences, sediment ponds, and by chemical treatment if necessary;

(4) Minimizing and/or treating mine water discharge to comply with U.P.D.E.S. discharge standards;

(5) Establishing where surface-water resources exist within or adjacent to the permit area through a Baseline Study (done) and monitoring quality and quantity of significant sources through impletation of a Water Monitoring Plan (proposed);

(6) Proper handling of potentially harmful materials (such as fuels, grease, oil, etc.) in accordance with an approved Spill Prevention Control and Countermeasure Plan (SPCC)

An unsuccessful attempt was made to convert bore-holes S-26, S-28, and S-31 to ground-water observation wells. S-26 and S-31, located south of the Williams Draw Fault, were offset with shallow piezometers A-26 and A-31 to observe ground water in the alluvium (Table 6-3); it is not clear from Table VI-3 whether or not these wells have been plugged and abandoned or if they are available for ground-water monitoring; however, the applicant has no data on A-26 and A-31 (Section 6.5.1, p. 21) and considers these wells unusable (Section 724.100).

Two other wells were bored in Horse Canyon to monitor water in the alluvium there. These two wells have since been sealed according to Section 724.100 (page 11); however, in Section 722.400 it states that one well will be used during mining and reclamation operations and sealed after reclamation is complete but that, to the applicant's best knowledge, the second well has been sealed. There are no logs or other geologic or hydrologic data from these wells in the PAP.

S-32 was drilled in 1981 and completed as a piezometer in the Grassy Member of the Blackhawk Formation. Its location is not shown on PAP maps. The PAP contains no data on ground-water elevation or quality for S-32 and the applicant states that other than the logs in Appendix 6-2 there are no geologic or piezometric data from S-32 (Section 6.5.1, p. 21).

In 1993 and 1994, IPA-1, IPA-2, and IPA-3 were drilled. There are seasonal water-level measurements in the PAP for IPA-1, IPA-2, and IPA-3 for 1994, 1995, and 1996 but not for 1997, 1998, or 1999.

Locations of all known seeps and springs, as well as watering ponds and tanks, are shown on Plate 7-1 (Section 722.200).

JBR Consultants Group conducted a seep and spring survey of the Horse Canyon area in 1985. Table 7-1 in the PAP contains flow, pH, conductivity, and temperature data collected in 1985 for nineteen seeps and springs: H-1 through H-11, H-13, H-14, H-18 through H-22, and H-92. Laboratory report sheets for H-2, H-4, H-11, H-13, H-14, and H-18 for 1994 and 1995 and for H-1, H-6, H-10, and H-21 for November 1985 are in Appendix 7-6. H-7, H-8, H-9, H-10, H-11, H-13, H-14, H-18, H-19, H-20, H-21, and H-22 could not be found on Plate 7-1.

Springs identified by JBR Consultants Group as H-21A, H-21B, H-18A, and H-18B were shown on a preliminary Plate 7-1 but were not listed or discussed in the PAP: the applicant states that no sample data or pertinent information are available for these sites, so they are no longer on Plate 7-1 (Section 724.100, page 14). The applicant states that HC-1A is not on Plate 7-1 for the same reason; however, HC-1A is still on Plate 7-1.

Appendix 7-1 contains seasonal information on ground-water quality and flow for seeps and springs 1, 9, 10, 14, 16(16Z), HC-2, HC-4, HC-9, HC-11, HC-13, HC-14, HC-18, HCSW-1. Data are from work done in 1993, 1994, and 1995 by EarthFax Engineering for the Los Angles Department of Water and Power. Water-quality descriptions include total dissolved solids or specific conductance corrected to 25°C, pH, total iron, and total manganese. Most other parameters listed in UDOGM directive Tech 004 were determined in these samples; however, total hardness, total alkalinity, and acidity were not reported (bicarbonate and carbonate were reported). Total rather than dissolved concentrations were determined for all metals. Springs and seeps HC-2, HC-4, HC-9, HC-11, HC-13, HC-14, HC-18, and HCSW-1 could not be found on Plate 7-1.

EarthFax also identified springs and seeps 1A,1B, 2, 3, 3A, 3B, 3C, 3D, 4, 5, 6, 7, 8, 8A, 8B, 9R, 10A, 11, 12, 12A, 12B, 12C, 12D, 12E, 13, 13A, 13B, 13Z, 14A, 15, 15A, 15B, 15C, 16A, 16B, 16C, 17, 17A, 17B, 18, 19A, 19B, 19C, 20, 22, HCSW-2, and HCSW-3. These were dry or had low flows at the time of the quarterly visits and no water-quality analyses were done. 8B, 15A, 17B, 18A, 19C, and HCSW-3 could not be found on Plate 7-1. Springs and seeps 8B, 15A,17B, 18A, 19C, and HCSW-3 could not be found on Plate 7-1.

Appendix 7-2 contains the 1997 Annual Hydrologic Monitoring Report for the Horse Canyon Mine with data for RS-2 (Redden Spring). The quarterly samples from this spring were analyzed for all Tech 004 parameters except total manganese and acidity.

Water rights are listed in Table 7-2. The list includes Redden Spring plus springs identified as Mont, Leslie, Cottonwood, Willows, Konna, and Pine. In addition there are eleven unnamed or otherwise unidentified springs listed, plus a well. Locations of water rights are on Plate 7-3, and some of the locations on Plate 7-3 correspond roughly with springs shown on Plate 7-1. A water right for a well is listed in Table 7-2, but information in other parts of the PAP indicate this was a water monitoring well.

Baseline cumulative impact area information.

The Division will make a findings of the cumulative impacts when the Mining and Reclamation Plan is complete.

Much of the hydrologic and geologic information that is necessary to assess the probable cumulative hydrologic impacts of the proposed operation and all anticipated mining on surface- and ground-water systems for the cumulative impact area is probably available from federal and state agencies.

Any needed information that is not available from such agencies may be gathered and submitted by the applicant as part of the permit application. As discussed already, outside sources are referenced many times in Chapters 6 and 7, but the outside sources are not adequately described nor listed in a reference section.

The permit cannot be approved until the necessary hydrologic and geologic information is available.

Modeling.

Actual surface and ground water information is supplied in this application; therefore, modeling is not proposed. No surface water modeling has been conducted.

Alternative water source information.

A search was conducted of the State of Utah Water Rights files for all rights occurring within, and adjacent to, the permit area for a distance of one mile. The location of those rights are shown on Plate 7-3. A description of each of the rights is tabulated in Table 7-2.

As noted in the table, the majority of rights are owned by Basic Management L.L.C. (I.P.A.) for industrial use. Other rights owned by the B.L.M. or individuals are primarily for stockwatering.

Basic Management L.L.C. owns the rights to approximately 1.50 cfs in this area. Although the PHC (Appendix 7-3) indicates little, if any, adverse effects on water resources resulting from the operation, if such effects should become evident, lost water sources would be replaced from the rights owned by the company.

Probable hydrologic consequences determination.

Appendix 7-3 contains a determination of the probable hydrologic consequences (PHC) of the proposed operation based upon the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas. The PHC determination is based on baseline hydrologic, geologic, and other information collected for the permit application, but not on data statistically representative of the site. The applicant finds in the PHC determination that, based on available data and expected mining conditions, the proposed mining and reclamation activity is not expected to proximately result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit or adjacent areas that is used for domestic, agricultural, industrial or other legitimate purpose.

The applicant has determined that within the permit area, the general seasonal streamflow is ephemeral. The streams generally dry up by late spring with only occasional runoff during the summer resulting from rainfall events.

The applicant finds (PHC - Appendix 7-3) that, due to the close proximity and similarities of mining and drainage conditions, water quality and impacts to the channels from pumping the Lila Canyon Mine would be very similar to those experienced in the adjacent Horse Canyon Mine. However, the water-quality and downstream impacts that resulted from pumping the Horse Canyon Mine are not described or discussed adequately enough in the PAP for this comparison to be meaningful.

Because of the disturbed areas and the potential for large runoff events, the control of erosion is a prime factor in maintaining the hydrologic balance within the mine permit area. Sediment controls and a sediment pond will be constructed at the new mine site to minimize impacts. Surface water will be protected by use of sediment controls and all sediment from the disturbed area is to be delivered to and be deposited in the sediment pond.

Although subsidence presents a potential to alter the groundwater flow regime in the area, several factors tend to limit the effects of subsidence on the groundwater regime. Most of the local springs flow from perched systems in the North Horn Formation and are separated from the underlying regional aquifer. The North Horn contains swelling clays that tend to heal small fractures. Finally, the perched aquifers are lenticular and discontinuous so there is a great probability that fractures in one area will not drain all the different aquifers.

Springs are used by wildlife and livestock. Current conditions of springs and seeps reflect the impacts (if any) of 50 years of mining as well as pre-mining conditions. No depletion of flow and quality of springs is expected in the Lila Canyon area. The applicant has determined that to date there is no known depletion of flow and quality of surveyed springs in the Horse Canyon permit area. The basis for this determination is not clear: in Section 724.100 (page 13) the applicant states that it is impossible to precisely describe the area's pre-mining hydrology.

The applicant has determined that it is unlikely there will be any additional measurable impacts from the mining and reclamation activities at the Lila Canyon Mine. Springs are mostly located upstream of the permit areas or are in areas where subsidence resulting from post-1977 mining has

not been documented and is not expected. Springs above the mine should continue to flow, showing fluctuations that are related to variations in recharge.

The applicant finds that after reclamation it is unlikely that the groundwater level in the regional aquifer will ever rise to the level of any portal of either the Horse Canyon or Lila Canyon Mines, so there should be no natural discharge of groundwater through any sealed portals. Stand pipes are to be incorporated into the sealed portals of the Lila Canyon Mine so that water levels can be checked annually.

In the PHC the applicant finds that, based on available data and expected mining conditions, the proposed mining and reclamation activity is not expected to proximately result in contamination, diminution or interruption of any underground or surface source of water within the proposed permit or adjacent areas; however, some subjects, such as acid-forming or toxic-forming materials, flooding or streamflow alteration, and ground water and surface water availability, that are not clearly covered in the PHC could use further clarification. Numerous technical deficiencies have been identified in the PAP. Additional information that will be provided to meet those deficiencies may necessitate revision or at least expansion of the PHC determination.

Ground-water and Surface-water Monitoring Plans.

The applicant has based the ground-water and surface-water monitoring plans on the PHC determination and the analysis of baseline hydrologic, geologic, and other information in the permit application.

Water samples from seeps, springs, and streams will be analyzed for the parameters listed in Table 7-4. The parameters in Table 7-4 closely match those in Tech 004 except that dissolved iron and total alkalinity are not listed: dissolved iron and total alkalinity should be added to Table 7-4. Measuring total alkalinity is a necessary step in determining carbonate and bicarbonate so it is usually reported routinely by laboratories; it should be included by the applicant in Table 4. Total manganese is listed in the body of Table 7-4 with a note that analysis will be done for dissolved manganese; this has the potential for causing confusion in the future and the two parameters should be listed specifically and separately in Table 7-4.

Table 7-4 indicates that oil and grease is to be analyzed for in samples taken below the mine site only rather than at sites both above and below as recommended in Tech 004. A footnote indicates that this analysis will be done for designated samples only. Oil-and-grease needs to be determined both above and below the mine site to be an effective water-quality indicator, and the sites at which it will be measured need to be clarified.

Table 7-4 indicates that cation anion balance is to be determined only for surface-water samples taken below the mine site rather than at all locations: this is an important quality control measure and should be routine in all water-quality analyses.

Monitoring reports will be submitted to the Division at least every three months, within 30 days following the end of each quarter.

The applicant's water-monitoring plan is intended to provide data to show impacts to potentially affected springs, seeps, impoundments and drainages within and adjacent to the permit area by comparison with relevant baseline data and with applicable effluent limitations. The applicant has selected monitoring locations and frequencies, described in Table 7-3, so that significant springs, seeps, impoundments and drainages that could potentially be impacted by the mining and reclamation operations will be monitored on a regular basis. (Section 731.222.1).

Ground-water monitoring plan.

Ten sites are proposed for ground-water monitoring: L-5-G through L-11-G and IPA 1, 2, and 3. They are listed in Table 7-3 and locations are shown on Plate 7-4. Seeps and springs will be monitored quarterly for parameters listed in Table 7-4. Station L-5-G is the potential mine discharge point and will be monitored in accordance with UPDES Permit requirements. IPA 1, 2, and 3 will be monitored quarterly for depth.

Stations L-6-G through L-11-G are significant springs located over the area of proposed mining. The relationship of these springs to seeps and springs monitored previously by JBR Consultants, EarthFax Engineering, and others is described in Table 7-3; however, this relationship is not always clear, especially on the maps in the PAP.

Four of the springs proposed for operational monitoring are identified by the applicant as L-8-G (Cottonwood Spring), L-9-G, L-10-G (Pine Spring), and L-11-G and correspond with the springs monitored by EarthFax as 9, 10, 22, and 13A, respectively. Springs 9 and 10 have data from 1993, 1994, and 1995 but nothing more recent. The PAP contains some data on field parameters from 1995 and 1993 for Springs 22 and 13A but no analysis reports: these two springs were usually observed to be dry from 1993 to 1995. L-6-G (Mont Spring) and L-7-G (Leslie Spring) correspond roughly with a group of springs monitored by JBR Consultants in 1985; there are baseline data in the PAP for the JBR springs for 1994 and 1995, but the correlation to the springs proposed for operational monitoring is not clear.

A-26 and A-31 were bored as offsets to S-26 and S-31 to observe ground-water levels in the alluvium south of the Williams Draw Fault. Table VI-3 does not indicate that these wells have been plugged and abandoned; however, the applicant has no data on A-26 and A-31 (Section 6.5.1, p. 21). S-32 was drilled in 1981 and completed as a piezometer in the Grassy Member of the Blackhawk Formation. The applicant considers these sites unusable (Section 724.100).

Surface-water monitoring plan.

Intermittent drainages in the area flow in response to snowmelt and precipitation events. The proposed surface-water monitoring program will monitor Lila Canyon both above and below the disturbed mine site area at L-1-S, L-2-S, and L-3-S and the sediment pond discharge at L-4-S. No monitoring is proposed for Little Park Wash, which appears to be the major surface drainage in the permit area.

Streams will be monitored monthly. Sediment pond and mine discharges will be monitored monthly or as frequently as discharges occur.

Point-source discharge monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Environmental Health for Utah Pollutant Discharge Elimination System (UPDES) permits. A UPDES discharge permit application has been submitted to the Division of Environmental Health for the proposed sediment pond and mine water for the Lila Canyon operation. UPDES permit applications for the Lila Canyon Mine are provided in Appendix 7-5.

Probable hydrologic consequences determination.

The Probable Hydrologic Consequences (PHC) Determination is provided as a separate document in Appendix 7-3. This determination indicates minimal (or no) negative impacts of the mining or reclamation operation on the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas.

Water in this area is primarily used for stock or wildlife watering. Any impacts to the small surface springs or seeps as a result of mining would likely be offset by the emergence of new seeps or springs due to fracturing, mine water discharge or replacement of water rights as described under Sections 525, and 731.800.

With underground mining, there always exists a potential for impacting surface or ground water resources; however, as indicated in Section 525, subsidence effects are expected to be minimal due to the amount of cover and massive rock strata between the mining and the surface. Effects on underground water are also expected to be minimal, since this water is not presently issuing to the surface, and any necessary discharges of the water would be in accordance with U.P.D.E.S. requirements.

Findings:

Hydrologic Resource Information is not considered adequate to meet the requirements of this section. Prior to approval the applicant must provide the following information:

R645-301-731, The applicant should identify if any of the upper reaches of Lila Canyon and Little Park Wash are perennial or intermittent.

R645-301-624, -624.210, Two wells were located in the alluvium in lower Horse Canyon Creek. It is not clear whether the well located nearer the Horse Canyon surface facilities has been sealed and abandoned (as indicated to Section 724.100, page 11) or is operational and is to be used during mining and reclamation operations (as indicated in Section 722.400). There are no data from either well in the PAP.

R645-301-724.100, There are seasonal water-level measurements in the PAP for IPA-1, IPA-2, and IPA-3 for 1994, 1995, and 1996 but no measurements for 1997, 1998, or 1999.

R645-301-724.100, -724.200, The 1997 quarterly samples from Redden Spring (RS-2), HC-1, HC-2 (B-1), and RF-1 were analyzed for all required parameters except total manganese.

R645-301-724.100, -724.200, The following data are briefly mentioned in Appendix 7-3; however, the actual data are not in the PAP, the results of the analyses are not discussed with the baseline information, and there is no reference to the source of these data:

- RS-1 and RS-2 (Redden Spring) were sampled once a year during 1978, 1979, and 1980 and analyzed for most major chemical constituents.
- Springs H-6, H-18, and H-21 were sampled once and analyzed for the major constituents in 1985.
- Third quarter data for 1989 were collected for HC-1 and RF-1 and sampled for most of the parameters in UDOGM's guidelines.
- Between January 1981 and April 1983, baseline water quality data were collected for surface water and spring sites B-1 (HC-2), HC-1, RF-1 and RS-2 on the Horse Canyon permit area. Between 14 and 19 samples, depending on the site, were taken and analyzed during the monitoring period.
- The U.S. Geological Survey conducted a water quality study in Horse Canyon from August 1978 until September 1979. Samples were taken monthly from the Horse Canyon Creek and analyzed for most major ions and cations and field parameters. Metals, eight nitrogen species and other minor chemical constituents were taken on a quarterly basis or less.

R645-301-724.200, There are no baseline data for the stream in Little Park Wash, the main drainage through the permit area. Little Park Wash is mentioned Sections 724.100 and 724.200 and in Tables 7-2 and 7-3 but is not further described or discussed.

R645-301-724.200, Range Creek drainage is mentioned in Section 724.100 but Range Creek is not further described or discussed. There are no baseline data.

R645-301-724.200, Flow and water-quality data for Horse Canyon Creek (HC-1, HC-2, and RF-1) from the Horse Canyon Mine 1997 Annual Report are in Appendix 7-2, and 1994 data for HC-2 are in Appendix 7-6. Additional data for Horse Canyon Creek are available from other annual reports of the Horse Canyon Mine and these data should be included and evaluated in the PAP.

R645-301-724.200, -728, In the PHC the applicant finds that to date there is no known depletion of flow and quality of surveyed springs in the Horse Canyon permit area. The basis for this determination is not clear: in Section 724.100

(page 13) of the PAP the applicant states that it is impossible to precisely describe the area's pre-mining hydrology.

R645-301-724.200, -728, In the PHC (Appendix 7-3) the applicant finds that, due to the close proximity and similarities of mining and drainage conditions, water quality and impacts to the channels from pumping the Lila Canyon Mine would be very similar to those experienced in the adjacent Horse Canyon Mine. However, the water-quality and downstream impacts that resulted from pumping the Horse Canyon Mine are not described or discussed adequately enough in the PAP for this comparison to be meaningful.

R645-301-724, -728, In the PHC the applicant finds that, based on available data and expected mining conditions, the proposed mining and reclamation activity is not expected to proximately result in contamination, diminution or interruption of any underground or surface source of water within the proposed permit or adjacent areas; however, some subjects, such as acid-forming or toxic-forming materials, flooding or streamflow alteration, and ground water and surface water availability, that are not clearly covered in the PHC could use further clarification. Numerous technical deficiencies have been identified in the PAP. Additional information that will be provided to meet those deficiencies may necessitate revision or at least expansion of the PHC determination.

R645-301-731.210, Two of the springs proposed for operational monitoring, L-6-G (Mont Spring) and L-7-G (Leslie Spring), correspond roughly with a group of springs monitored by JBR Consultants in 1985:

- The correlation between the JBR springs and L-6-G and L-7-G is not clear.
- Baseline data in the PAP for the JBR springs is not adequate (1994 and 1995 but nothing more recent) .

R645-301-731.210, Four of the springs proposed for operational monitoring are identified by the applicant as L-8-G (Cottonwood Spring), L-9-G, L-10-G (Pine Spring), and L-11-G and correspond with the springs monitored by EarthFax as 9, 10, 22, and 13A, respectively:

- Springs 9 and 10 have data from 1993, 1994, and 1995 but nothing more recent.
- The PAP contains some data on field parameters from 1995 and 1993 for Springs 22 and 13A but no analysis reports: these two springs were usually observed to be dry from 1993 to 1995.

R645-301-731.210, -731.220, The parameters in Table 7-4 closely match those in Tech 004 except that dissolved iron and total alkalinity are not listed. Measuring total alkalinity is a necessary step in determining carbonate and bicarbonate so it is usually reported routinely by laboratories along with

carbonate and bicarbonate, and it should be included by the applicant in Table 7-4.

R645-301-731.210, -731.220, Dissolved iron should be added to Table 7-4.

R645-301-731.210, -731.220, Total manganese is listed in the body of Table 7-4 with a footnote that analysis will be done for dissolved manganese; this has the potential for causing confusion in the future and the two parameters should be specifically and separately listed in Table 7-4.

R645-301-731.210, -731.220, Table 7-4 indicates that oil and grease is to be analyzed for in samples taken below the mine site only rather than at sites both above and below as recommended in Tech 004. A footnote indicates that this analysis will be done for designated samples. Oil-and-grease needs to be determined both above and below the mine site to be an effective water-quality indicator, and the sites at which it will be determined need to be clarified.

R645-301-731.210, -731.220, Table 7-4 indicates that cation anion balance is to be determined only for surface-water samples taken below the mine site rather than at all locations: this is an important quality control measure and should be routine in all water-quality analyses.

R645-301-731.220, No monitoring is proposed for Little Park Wash, which appears to be the major surface drainage in the permit area. The reasoning for not monitoring is not discussed in the PAP.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Affected Area Boundary Maps

Plate 5-4 and other maps show the permit boundaries that are the same as the affected area boundaries for the Horse Canyon Mine. The Horse Canyon Mine includes the Horse Canyon project and the Lila Canyon project. Plate 5-5, Mine Map, shows the affected area boundaries for the Lila Canyon project and the timing and sequence of mining.

Archeological Site Maps

The locations of cultural and historic resources in the area are shown on Plate 4-3 and on maps in Appendix 4-1. This information is adequate but needs to be kept confidential.

Coal Resource and Geologic Information Maps

Depth to the Sunnyside Seam, which is the seam to be mined, is shown on the Cover and Structure Map on Plate 6-4. Thickness of the Sunnyside Seam is shown on the Coal Thickness Isopach map on Plate 6-3. Thickness and nature of the Sunnyside Seam, of coal or rider seams above the Sunnyside Seam, and of the stratum immediately below the Sunnyside Seam are shown on the Coal Sections on Plate 6-5, but these sections do not show areal and vertical distribution of aquifers or information on water levels and the relationship of ground water to geologic structure and stratigraphy. There is no cross section showing the relationship of the rock tunnels to structure, stratigraphy, and ground water.

Figures VI-1 and VI-2 show the general stratigraphy of the permit and adjacent areas. Plate 6-1 shows surface geology, including coal crop lines, and the strike and dip of the Sunnyside Seam within the proposed permit area. Except for the Sunnyside Fault, which is referred to as a feature that possibly controls ground-water flow, the major faults are shown on Plates 6-1 through 6-5, and structural elevation contours on the Sunnyside Seam are on Plate 6-4. The Sunnyside fault limited mining to the east in the Horse Canyon Mine and has the potential of limiting coal recovery at the Lila Canyon Mine.

The coal seam crops out at approximately 6,500 feet in the vicinity of the rock-slope tunnels. The PAP indicates the tunnels will intercept the coal seam at approximately 6,300 feet. Coal-seam elevations determined from bore holes are on Plates 6-2, 6-3, and 6-4.

Existing Structures and Facilities Maps

Plate 5-1A, Pre Mining Contours, shows the existing structures in the proposed Lila Canyon disturbed area. The only existing structure is a 36" culvert scheduled to be replaced when the mine facilities area constructed. A description of the culvert is given in Section 526.110 and 521.120 of the PAP.

Existing Surface Configuration Maps

The Permittee shows the existing surface contours on Plate 5-1A. The contours on Plate 5-1A extend more than 100 feet from the disturbed area boundaries. The contour intervals on Plate 5-1A are 25 feet. The Division does not have a regulatory requirement for minimum contour intervals or map scale. However, the Division has found that to develop adequate reclamation plans that the maps must have contour intervals of at least 2 feet and a scale of 1 inch equal 100 feet. The Permittee should also give the Division copies of any aerial photographs that show the predisturbed site.

Mine Workings Maps

Location and extent of the Horse Canyon Mine permit area is outlined on numerous plates in the PAP, including Plate 5-1, but it is not clear where mining was done and not done within this permit area. Plate 5-1 shows old or abandoned mine workings outside the Horse Canyon permit area, except the 6,080-foot exploration entry from the Horse Canyon Mine is not shown. Locations of sealed openings to the Horse Canyon Mine and other mines are not identified. Plate 5-1 shows an area west of the Horse Canyon Mine, outside the line marking the limits of old works, labeled "Book Cliffs Coal Company". The active coal fire area in the old workings north of Horse Canyon is not shown on any map or discussed in the text.

Monitoring Sampling Location Maps

Elevations and locations of test borings are on Plates 6-2, 6-3, and 6-4, except that the location of S-32 is not shown on any map. It can be determined from the log in Appendix 6-1 that S-32 is in T. 17 S., R. 15 E. but the Section cannot be identified because of the poor quality of the copy. Elevations of core samples are tabulated in Tables VI-1 and VI-3.

Elevations and locations of monitoring stations used to gather data on water quality and quantity in preparation of the application are on Plate 7-1. Water-quality or -quantity data for springs and seeps 8B, 15A,17B, 18A, 19C, HC-2, HC-4, HC-9, HC-11, HC-13, HC-14, HC-18, HCSW-1, HCSW-3, H-7, H-8, H-9, H-10, H-11, H-13, H-14, H-18, H-19, H-20, H-21, and H-22 are in the PAP; however, these seeps and springs could not be found on Plate 7-1.

Springs H-21A, H-21B, H-18A, and H-18B were previously shown on Plate 7-1 but were not listed or discussed in the PAP: the applicant states that no sample data or pertinent information are available for these sites, so they are no longer on Plate 7-1 (Section 724.100, page 14). The applicant states that HC-1A is not on Plate 7-1 for the same reason; however, HC-1A is still on Plate 7-1.

Permit Area Boundary Maps

Several maps including Plate 5-1 show the location of the permit boundaries for the Horse Canyon mine. The permit boundary have been divided into Permit Area A (the Horse Canyon project) and Permit Area B (the Lila Canyon project).

Surface and Subsurface Ownership Maps

A search was conducted of the State of Utah Water Rights files for all rights occurring within, and adjacent to, the permit area for a distance of one mile. The location of those rights are shown on Plate 7-3. A description of each of the rights is tabulated in Table 7-2.

Subsurface Water Resource Maps

Ground water was encountered in several bore holes as well as in the Horse Canyon Mine. Water-level elevation contours are on Plate 7-1; otherwise, areal and vertical distribution of aquifers within the proposed permit or adjacent areas is not shown on a map. Seasonal variation in water levels is tabulated in Appendix 7-1, but there is no portrayal of seasonal differences of head on cross sections and contour maps.

The Minerals Development Corporation (MDC) well in Section 9 of T. 16 S., R. 14 E. is listed in Table 7-2 . The MDC well and another well that is located nearer the Horse Canyon Mine surface facilities are discussed in Section 724.200. These wells were for observation of ground water in the alluvium in Horse Canyon. To the best of the appellant's knowledge the MDC well has been sealed. Both wells are shown on Plate 7-1 but they are not clearly identified.

Also shown on Plate 7-1 are S-26 and S-31, located south of the Williams Draw Fault. These wells were offset with shallow piezometers A-26 and A-31 to observe ground water in the alluvium (Table 6-3), although A-26 and A-31 are not specifically identified on the map.

The ground-water elevation in the Horse Canyon Mine, at the rotary car dump at the intersection of the Main slope and 3rd level, is described in Section 724.100 (page 14); it was approximately 5,800 feet in 1986 and the applicant states that it probably has remained at this level since operations ceased in the Horse Canyon Mine. This projected ground-water elevation does not appear to have been used in projecting the piezometric surface mapped on Plate 7-1. The location of the sump is described in the text but is not shown on Plate 7-1.

Water rights are listed in Table 7-2. The list includes Redden Spring plus springs identified as Mont, Leslie, Cottonwood, Willows, Konna, and Pine. In addition there are eleven unnamed or otherwise unidentified springs listed, plus a well. Locations are on Plate 7-3. Some of the spring locations in Table 7-2 and on Plate 7-3 correspond roughly with springs shown on Plate 7-1, but it is often unclear whether or not they are the same spring. There are several springs listed in Table 7-2 - Water Rights - and shown on Plate 7-3 that are not shown on Plate 7-1, or at least do not correspond to any spring shown on Plate 7-1. Redden Spring is labeled water right 91-4959 on Plate 7-3, RS-2 on Plate 7-4, and H-6 on Plate 7-1.

Acknowledging that point-of-diversion locations such as those in Table 7-2 are often imprecise:

- The location of Cottonwood Spring (L-8-G) on Plate 7-1 does not match that on Plate 7-3 and in Table 7-2.

- The location of Konna Spring on Plate 7-3 (NE 8, T. 16 S., R. 15 E.) does not match that given in Table 7-2 (SW 18, T. 16 S., R. 15 E.).

- The location of RS-2 (Redden Spring, water right 91-4959) on Plates 7-1, 7-3, and 7-4 (NE 3, T. 16 S., R. 14 E.) doesn't match that described in Table 7-2 (NW 3, T. 16 S., R. 14 E.).

Vegetation Reference Area Maps

Two proposed reference areas are shown on Figure 1 of the Lila Canyon Vegetation Inventory report in Appendix 3-2. This map needs to include a north arrow and a scale. It should also show the boundaries of the proposed disturbed area and of vegetation communities.

Although Plate 3-2 shows vegetation communities of the proposed permit area, it does not contain the level of detail needed for the proposed disturbed area. It is difficult to compare this plate with the surface facilities map with any confidence and know where the facilities would be.

Surface Water Resource Maps

According to the applicant, locations of all known seeps and springs, watering tanks, or ponds are shown on Plate 7-1, and there are no known streams, lakes, or ponds within the permit and adjacent areas.

Text in Section 724.200 refers to Plate 7-1 for the location of Horse Canyon and Lila Canyon Creeks and Little Park Wash. Range Creek drainage is mentioned in the description of the ground-water divide of the main aquifer in Section 724.100 but Range Creek is not labeled on maps.

Water rights are listed in Table 7-2 and shown on Plate 7-3.

Well Maps

One oil exploration hole has been drilled on the property by Forest Oil Company. The location of the hole is shown on Plate 6-2. The depth and other details of this well are not known.

Contour Maps

Contour Maps of the proposed disturbed area and mining areas are included as Plates 5-2A, 5-2B, 7-1 and 7-2. These maps are U.S.G.S. based contours and accurately represent the proposed permit and adjacent areas. Disturbed area maps are based on aerial photography for greater detail, and are tied to relevant U.S.G.S. elevations.

The Permittee gave the Division premining, operational and reclamation contour maps of the Lila Canyon site. The scale of the maps and the contour intervals are inadequate. If the Division were to reclaim the site we would need base maps at a scale of no less than 1 inch equals 100 feet and 2 foot contour intervals.

Findings:

Maps, Plans, And Cross Sections of Resource Information is not considered adequate to meet the requirements of this section. Prior to approval the applicant must provide the following information:

R645-301-323, The application needs to contain maps showing the reference areas and vegetation communities in relation to the proposed surface facilities. The maps need to contain information as required in R645-301-140.

R645-301-622.100, -722.300, The location of S-32 is not shown on any map: it can be determined from the log in Appendix 6-1 that it is in T. 17 S., R. 15 E. but the Section cannot be identified because of the poor quality of the copy.

R645-301-624.100, -624.110, Reference is made in several places in the text to the Sunnyside fault, a feature that possibly controls ground-water flow and coal recovery, but this fault is not shown on the maps.

R645-301-623, -722, -731.521, There is no cross section showing the relationship of the rock tunnels to geologic structure, stratigraphy, and ground water.

R645-301-624.100, -722.100, Water-level elevation contours based on the three IPA wells are on Plate 7-1; otherwise, areal and vertical distribution of aquifers within the proposed permit or adjacent areas is not shown on maps and cross-sections. There are no cross sections showing location and extent of ground water and its relation to geologic structure and stratigraphy.

R645-301-722.100, A water right for the Minerals Development Corporation (MDC) well is listed in Table 7-2. The MDC well and another well that is located nearer the Horse Canyon Mine surface facilities are discussed in Section 722.400. Both wells are shown on Plate 7-1 but they are not clearly identified.

R645-301-722.100, -722.300, The ground-water elevation at the intersection of the Main slope and 3rd level in the Horse Canyon Mine, at the rotary car dump, is described in Section 724.100 (page 14) in Chapter 7 as "representative of the potentiometric surface in the rest of the mine."; it was approximately 5,800 feet in 1986 and the applicant states that it probably has remained at this level since operations ceased in the Horse Canyon Mine:

- The location is described in the text but is not shown on Plate 7-1 or other maps.
- This "representative" ground-water elevation does not appear to have been used in projecting the piezometric surface mapped on Plate 7-1.

R645-301-722.100, Seasonal variations in water levels tabulated in Appendix 7-1 are not portrayed on cross sections or contour maps.

R645-301-722.100, Range Creek drainage is mentioned in the description of the ground-water divide of the main aquifer in Section 724.100 but Range Creek is not labeled on maps.

R645-301-722.200 -722.300, Locations of all known seeps and springs are stated to be shown on Plate 7-1; however:

- Water quality and quantity data for springs or seeps 8B, 15A, 17B, 18A, 19C, HC-2, HC-4, HC-9, HC-11, HC-13, HC-14, HC-18, HCSW-1, and HCSW-3 are in Appendices 7-1 and data sheets for some are in Appendix 7-6, but their locations could not be found on Plate 7-1.
- H-7, H-8, H-9, H-10, H-11, H-13, H-14, H-18, H-19, H-20, H-21, and H-22 are listed in Table 7-1 and data sheets for some are in Appendix 7-6, but their locations could not be found on Plate 7-1.
- Water rights for several springs are listed in Table 7-2 and locations are on Plate 7-3. Some of the locations in Table 7-2 and on Plate 7-3 correspond roughly with

springs shown on Plate 7-1, but they do not clearly correspond to springs on Plate 7-1: it is often unclear whether or not the two maps are showing the same spring.

- RS-2 (Redden Spring, water right 91-4959) is at the same location on Plates 7-3 and 7-4, but on Plate7-1 that location is labeled H-6 and RS-2 is farther west (RF-1 is also farther west on 7-1 than on 7-4).

- The star, large black-circle (IPA wells), and black-square symbols used on Plate 7-1 are not explained in the Legend. The symbols for L-1-S through L-5-S are not explained in the Legend.

R645-301-724.100, The applicant states that HC-1A is not on Plate 7-1 because no sample data or pertinent information are available; however, HC-1A is on Plate 7-1.

R645-301-722.200 -722.300, Acknowledging that point-of-diversion locations such as those in Table 7-2 and on Plate 7-3 are often imprecise:

- The location of RS-2 (Redden Spring, water right 91-4959) on Plates 7-1, 7-3, and 7-4 (NE 3, T. 16 S., R. 14 E.) doesn't match that described in Table 7-2 (NW 3, T. 16 S., R. 14 E.).

- The location of Konna Spring on Plate 7-3 (NE 8, T. 16 S., R. 15 E.) does not match that given in Table 7-2 (SW 18, T. 16 S., R. 15 E.).

- The location of Cottonwood Spring (L-8-G) on Plate 7-1 does not match that on Plate 7-3 and in Table 7-2.

R645-301-722, Surface-elevation contours are displayed on several maps. On Plate 7-1 the 250-foot index contours were not printed, making it difficult to determine surface elevations.

R645-301-521.190, The Permittee must give the Division predisturbed, operational and reclamation contour maps that have a scale of not less than 1 inch equals 100 feet and has 2 foot contour intervals.

R645-301-521.190, The Permittee must give the Division copies of the aerial photographs that show the predisturbed area. If the Division were to reclaim the site, those photographs would be helpful in restoring the area.

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR Sec. 784.2, 784.11; R645-301-231, -301-526, -301-528.

Analysis:

General

The Permittee proposes to develop a surface facility and mine portals in Lila Canyon. The Permittee wants to develop the Lila Canyon facilities because access to the coal through the Horse Canyon portals is not feasible.

Access to the coal will be through two 1,200 foot slopes that will be driven from the base of the cliff. The ventilation portal will be driven from underground to the surface. Mining will be conducted in the Sunnyside Seam. Production in the first year is estimated to be 200,000 tons, the second year 1,000,000 tons and by the third year 4,000,000 tons. Annual production after the forth year will be 4,000,000 tons. Most of the coal will be recovered by longwall mining. Room and pillar mining will be used for development work and recover coal in areas that are not conducive to longwall mining.

Type and Method of Mining Operations

Mining will begin in Section 15, T16S, R14E, in the Sunnyside seam. Development of the Sunnyside seam will be in a down dip direction towards the east. The seam will be accessed by two 1,200 foot slopes driven up at 12% from the base of the cliffs. The ventilation fan portal will be driven from underground to the surface.

Production during the first year is estimated to be 200,000 tons, the second year 1,000,000 tons and peak in the third year at 4,000,000 tons. Production should continue at 4,000,000 tons for the life-of-mine. The mine is scheduled to cess operation in 2024, the life-of-mine will be 20 years.

In Appendix 4-3, Air Quality, the Permittee stated in a letter dated December 22, 1998 to the Division of Air Quality that a maximum of 2,000,000 will be produced every year. In Section 523 the Permittee states that a maximum of 4,000,000 of coal will be produced. The Permittee must clarify the maximum amount of coal that will be produced annually.

Mine production will begin with the slope construction. Once the coal is encountered development will continue using continuous miners and various types of haulage equipment. Continuous miners will account for all the production during the first two years. Mining will consist of driving mains, developing room-and-pillar panels and gate entries for future longwall mining.

The majority of the full extraction mining will be done using longwall equipment. However, in isolated areas room and pillar type of mining may be used in areas not suitable for longwall mining. Longwall panels are sited approximately parallel lengthwise to the strike with a slight up dip

orientation to provide drainage for the development faces. This practice will be applied to the continuous miner panels wherever possible.

Ventilation of the mine will be by an exhaust type system. The Permittee estimates that 900,000 cfm will be required at full production. Intake air will be supplied by slopes and entries from the surface.

Dust suppersion will be accomplished by the use of sprays on all underground equipment as required. Sprays will also be used along sections of the conveyors and a transfer points.

No major de-watering concerns are anticipated at this property. The workings are expected to produce some water with more water being produced as the depth of mining increases. Part of this water will be used for dust suppression. The remainder will be collected in sumps and pumped to mined out sections of the mine or to the surface and treated when necessary.

In Section 523 of the PAP, the Permittee listed the major mining equipment that will be used. The equipment is consistant with a major longwall operation.

Facilities and Structures

The new support facilities are described in Section 520 of the PAP, shown on plate 5-2 and in the appendixes in Chapter 5 of the PAP. Appendix 5-4, New Facility Design, shows the design for the roads and sewage systen. Appendix 5-7 has the designs for the refuse pile. The new structures and facilities listed in Section 520 are as follows:

Mine Facilities Road
Security Shack
Mine Substation
Office/Bathhouse/Warehouse Parking Area
Office/Bathhouse
Mine Parking
Shop Warehouse
Non-Coal Waste Area
Equipment & Supplies Storage Area
Sewer Tank & Drain Field
Water Treatment Plant
Potable Water Tank
Process Water Tank
Topsoil Pile
Refuse Pile
Sediment Pond
Slope Access Pond
Rock Slopes
Ventilation Fan
ROM Underground Belt
ROM Storage Pile
Crusher

Coal Storage Bin
Truck Scale and Loadout

The Permittee proposes to construct only one impoundment, a sediment pond show on Plate 5-2. Since Lila Canyon is an underground mine no overburden or spoil will be removed. Topsoil storage and handling areas will be discussed by the Division's soil scientist. The Permittee does not plan on cleaning or processing the coal beyond crushing: therefore facilities for storing coal processing waste were not included in the MRP.

In Section 528.100 the Permittee describes how the coal will be handled and stored. The Permittee outline the coal storage area on Plate 5-2. The Permittee did not state the maximum amount of coal that would be stored on the surface. The Division needs to know the maximum amount of coal that will be stored on site.

In Section 528.300 the Permittee described how spoil, coal processing waste, mine development waste, and noncoal waste removal, handling, storage, transportation, and disposal areas and structures. Since the Lila Canyon is an underground mine the Permittee does not expect any excess spoil. Coal mine waste will be disposed in new or existing facilities. Since there are no existing facilities at Horse Canyon the Division want the Permittee to specify were the existing coal mine waste disposal facilites are located or remove the reference from the PAP.

The Permittee states that material from the rock slopes will be used to construct the pad. The Division believes that material is coal mine waste and must be placed in a refuse pile.

The water pollution facilities include the drain fields and sediment pond.

Findings:

R645-301-121.200, On Page 33, Section 523 the word cjould should be spelled could.

R645-301-121.200, On Page 68, Section 528.320 the Permiittee states that coal mine waste will be place in new or existing disposal areas. The Permittee must either idenitfy all existing coal mine waste disposal areas or change the wording. At present there are not existing disposal areas in the permitted area.

R645-301-521.190, The Permittee must state the maximum amount of coal that will be stored on site.

R645-301-536, The Permittee must give the Division detailed plans for the refuse disposal areas where the material from the rock tunnels will be placed.

EXISTING STRUCTURES

Regulatory Reference: 30 CFR Sec. 784.12; R645-301-526.

Analysis:

One existing culvert is shown on Plate 5-1A to be in the proposed disturbed area. The Permittee states in Section 526.110 and Section 521.120 of the PAP that a 36" culvert exists in the proposed disturbed area. The culvert is in poor condition and will be replaced during construction.

Findings:

The Permittee met the minimum requirements of this section.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR Sec. 784.17; R645-301-411.

Analysis:

The proposed addition to the permit area contains no known cultural resources listed or eligible for listing in the National Register of Historic Places, public parks, or units of the National System of Trails or the Wild and Scenic Rivers system. Therefore, no protection plan is needed.

The Turtle Canyon Wilderness Study Area overlaps with the proposed addition to the permit area in the following locations:

Township 16 South, Range 14 East
Section 13, E½ NW¼, NE¼
Section 24, NE¼ NW¼, N½ NE¼

Township 16 South, Range 14 East
Section 19, SE¼ SW¼, Lots 3 and 4
Section 30, SW¼ NE¼

The policy of the Bureau of Land Management is to not allow surface occupancy in wilderness study areas any more than absolutely necessary and only in cases where there are valid existing rights. The applicant has not proposed surface-disturbing activities in these areas, and considering the topography, the Bureau of Land Management feels it is unlikely exploration, ventilation shafts, or other disturbance would be practical. If the applicant proposes surface-disturbing activities in these areas, they will be scrutinized very carefully.

The Bureau of Land Management has prepared two environmental analyses discussing the anticipated effects of subsidence in these areas. If subsidence is expressed on the surface, it is likely to consist of a lowering of the land elevation with some surface cracks, and there could be some

disruption of the hydrologic balance. Overall, however, the Bureau of Land Management felt the effects of undermining these areas would be small.

The "Land Use Resource Information" section of this analysis discusses the 1999 Utah Wilderness Inventory. As more information becomes available, the application will need to discuss management strategies for the new areas being considered for wilderness classification.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR Sec. 784.18; R645-301-521, -301-526.

Analysis:

In Section 521.133.1 of the Lila Canyon Amendment the Permittee state:

Emery County has given permission to conduct coal mining or reclamation operations within 100 feet of the county road. (See Appendix 1-4)

Appendix 1-4 does not contain any correspondence from Emery County. The only letters in Appendix 1-4 are from the BLM stating that they recieved five right-of-way applications and a letter from Utah American Energy to Rex Funk, county road supervisor. The Permittee must either place the documents that show the County gave permission to construct the mine facilities within 100 feet of the County road or remove the reference.

The Division is concerned about how close the sediment pond is located to the public road (County Road 163). The Division needs to know what measures will be taken to protect the public from the hazards associated with the sediment pond and other mine facilities.

Findings:

R645-301-526.133 and R645-301-526.116, The Permittee must show how the public will be protected from mining and reclamation activities that are constructed within 100 feet of the county road. Specifically the Permittee must address how the public will be protected from the hazards associated with the sediment pond and other mine facilities.

R645-301-121.200, The Permittee must either include the letter from Emery County stating that they have approved the construction of the mine facilities next to the county road or remove the reference.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR Sec. 784.26, 817.95; R645-301-244.

Analysis:

The application says Appendix 4-3 contains the Air Quality Permit from the Utah Bureau of Air Quality. Appendix 4-3 has a cover letter from UtahAmerican Energy for the Air Quality Notice of Intent and a copy of the Intent to Approve from the Division of Air Quality. Since Appendix 4-3 does not contain a copy of the Air Quality Permit as stated in the application, the application is incorrect. Until the Air Quality Permit is received and put in the appendix, the application should indicate the applicant has applied for the permit but that it has not yet been received. Also, the regulatory authority enforcing the Clean Air Act has been changed from the Utah Bureau of Air Quality to the Utah Division of Air Quality, and the application should be updated.

The letter in Appendix 4-3 from Jay Marshall to the Division of Air Quality says the applicant is requesting approval for a throughput of up to 2,000,000 tons per year, and the Intent to Approve says up to 1,500,000 tons of coal could be mined in a rolling twelve month period. Section 523 of the application indicates production should be between 1,000,000 and 1,500,000 tons per year for the first five years but that production could peak at 4,500,000 tons. Therefore, the application is consistent with the Air Quality Intent to Approve for the first five years. Any increase in production after five years would require amendments to both the Air Quality Approval Order and the mining and reclamation plan.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

R645-301-420, The text of the application needs to show the applicant has submitted a Notice of Intent with the Division of Air Quality and that Air Quality has issued its Intent to Approve. Contrary to the application, Appendix 4-3 does not contain a copy of the Air Quality Permit (or Approval Order).

COAL RECOVERY

Regulatory Reference: 30 CFR Sec. 817.59; R645-301-522.

Analysis:

The Permittee describes the coal recovery methods in Section 522 of PAP. The Permittee plans on using longwall mining methods whenever possible. Room-and-pillar mining will be used in areas where longwall panels cannot be developed or where only first mining is allowed.

R645-301-522 requires the Permittee to give a description of the measures to be used to maximize the use and conservation of the coal reserves. The extraction ration and the supporting calculations must be included in the coal recovery plan. Without that information the Division is unable to determine if coal recover plan is adequate.

Findings:

R645-301-522 and R645-301-525.240, The Permittee must give the Division a detailed coal recovery plan. That plan must include the coal extraction ratios and the calculations for the longwall areas, full extraction room-and-pillar areas and first mining only areas.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR Sec. 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Renewable resources survey.

The Permittee claims that no renewable resources exist in the proposed subsidence area. That information conflicts with other information in the MRP. "Renewable Resource Lands" are defined in R645-100 as aquifers and areas for the recharge of aquifers and other underground waters, areas for agricultural or silvicultural production of food and fiber, and grazing lands. Grazing is identified as a land use in the proposed addition to the permit area, and there is at least some recharge to aquifers. In addition there are two and possibly four eagle nests in the subsidence area. Therefore, the area does fall within the definition of renewable resource lands.

While the Permittee does not agree with the Division's findings that renewal resources exist in the potential subsidence area the Permittee has agreed to supply the Division with a subsidence control plan.

Subsidence control plan.

(1) Coal will be removed using a combination of continuous miners and longwall methods. Details of the mining plan are given in Section 522 and 523. Plate 5-5 shows the mine layout and the sequence and timing of mining. The Division considers that information adequate to determine the timing and extent of subsidence.

(2) On Plate 5-5 the Permittee shows the proposed underground workings and the areas of potential subsidence. Plate 5-5 does shows those areas were subsidence control methods (first mining only) will be used to protect escarpments. The Permittee does not show the location of the seeps, springs, and eagle nests that need to be protected from subsidence.

R645-301-525.100 requires that the Permittee provide the Division with a map of the permit area at a scale of 1:12,000 or larger that shows the areas where subsidence could occur. The Permittee did not give the Division a map at the required scale that shows the surface areas that are in the plan subsidence zone.

R645-301-525.240 requires that the Permittee submit a detailed plan of the underground workings. Plate 5-5 shows the location of the proposed mine working and the timing and sequence of mining.

(3) A description of the physical conditions which affect the likelihood or extent of subsidence and subsidence-related damage are given in Chapter 6 of the amendment. The Division geologist will determine if that information is adequate.

(4) R645-301-525.440 requires that the Permittee describe the subsidence monitoring plan. The Permittee does not give any details of the subsidence monitoring plan. The only information about the plan is that it will involve ground and aerial surveys. The Division needs more details about the subsidence monitoring plan before it can be evaluated.

(5) The Permittee state that the escarpments will be protected from subsidence by allowing first mining only within 200 ft. of the outcrops. The Permittee does not state why a buffer zone of 200 feet was used. The anticipated effects of planned subsidence may include tension cracks, fissures, sinkholes and lowering of the ground surface.

The Permittee does not plan to take steps to prevent subsidence except for escarpment protection. The Permittee does state in the amendment that if subsidence causes damage then he will restore the land to a condition capable of maintaining the value and reasonable foreseeable uses which the land was capable of supporting before subsidence.

(6) The Permittee states that the anticipated effects of subsidence are:

> Anticipated effects of planned subsidence may include tension cracks, fissures, or sinkholes. Areas of minimal ground lowering may be anticipated. The Division has received comment from the public that subsidence might damage seeps and springs in the area. The Permittee must address these concerns.

(7) The Permittee describes the measures to be taken to mitigate or remedy any subsidence-related material damage to, or diminution in value or reasonably foreseeable use of the land, or structures or facilities to the extent required under State law as follows:

If the effects of subsidence is confirmed by a ground survey, any material damage to the surface lands will be restored to the extend technologically and economically feasible. The land will be restored to a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting before the subsidence.

(8) The format and regulations sighted in the subsidence section of the amendment do not correspond to the regulation in the Utah Coal Rules Revised on May 1, 1998. The Permittee needs to submit the subsidence section of the amendment in the updated format.

A general deficiency in the subsidence plan is that the subsidence plan is as follows:

R645-301-121.300 requires the Permittee to submit the amendment in the format required by the Division. The format used by the Permittee in the subsidence section of the amendment does not correspond to the format in the Utah Coal Rules Revised May 1, 1988.

According to the application, the main potential effects of subsidence would be escarpment failure and disruption of surface and ground water. It appears there are at least two and possibly four eagle nests in the area that would be subsided even though the applicant has committed to protect these nests. This is discussed in detail in the section of this analysis dealing with the fish and wildlife protection plan.

Section 525.100 says no renewable resource lands exist within the proposed permit area and adjacent areas, but this statement is not correct and needs to be modified. "Renewable Resource Lands" are defined in R645-100 as aquifers and areas for the recharge of aquifers and other underground waters, areas for agricultural or silvicultural production of food and fiber, and grazing lands. This definition says nothing about the significance of the land for these uses. Grazing is identified as a land use in the proposed addition to the permit area, and there is at least some recharge to aquifers. Therefore, the area does fall within the definition of renewable resource lands.

According to the application, ground water will probably be intercepted in the course of mining, but it is not known whether it is perched or an active recharge aquifer. If the mine was to discharge water, it could benefit wildlife, at least through the life of the mine.

The mitigation for losses of wildlife habitat through subsidence could include habitat enhancement to increase production of selected forage species, and development of off-site water sources, such as guzzlers.

Subsidence cracks are occasionally large enough to be dangerous for wildlife, livestock, and people that might be in the area. The applicant has committed in Sections 525.160 and 525.231 to restore to the extent technologically and economically feasible material damage to the surface lands. This commitment is in accordance with regulatory requirements and is considered adequate.

A standard stipulation on federal leases is that the lessee monitor the effects of underground mining on vegetation. The applicant needs to include a plan to do this. In response to the previous technical analysis, the applicant added a statement that it has been demonstrated that subsidence has little direct impact on wildlife or vegetation with the exception of escarpment failure and disruption of surface or ground water. This statement does not satisfy the requirements of the stipulation because it does not show how the applicant will monitor the effects of mining on vegetation.

Performance standards for subsidence control.

The Permittee is required to meet all the subsidence performance standards.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-332, Section 525.100, indicates there are no renewable resource lands within the proposed addition to the permit area; however, according to the definition of renewable resource lands and information in the land use chapter of the application, the proposed addition to the permit area does include renewable resource lands.

R645-301-332, The applicant needs to show how the effects of underground mining on vegetation will be monitored.

R645-301-121.200, The Permittee must use a standard angle of draw for subsidence calculation of justify why different angles of draw are used. On Page 32, of the PAP Section 522 the Permittee states that the width of the escarpmetn barrier will be determined by implemnting a 20° angle of draw. On Plate 5-5 the Permittee states that a 21.5° angle of draw was used to find the mazimum extent of subsidence.

R645-301-121.200, The Permittee must state why a buffer zone of 200 feet was used to protect the escarpments from subsidence.

R645-301-525.490 and R645-301-525.440, The Permittee must show on Plate 5-5 or other similar maps those surface structures such as seeps and springs and eagle nests. that need to be protected from subsidence.

R645-301-525.100, The Permittee must provide the Division with a map of the permit area at a scale of 1:12,000 or larger that shows the areas where subsidence could occur.

R645-301-525.440, The Permittee does not give details of the subsidence monitoring plan. The only information about the plan is that it will involve ground and aerial surveys. The Division needs more details about the subsidence monitoring plan before it can be evaluated. The additional information must include but not be limited to the location of all subsidence monitoring points on the subsidence maps (Plate 5-5).

R645-301-525.120, The Permittee must describe the potential damage to State-appropriated water rights. Since the Division has received comment from water users about the potential for damage to water rights the Permittee must

address this issue. The Permittee must also describe the potential subsidence effects on the eagle nests.

R645-301-121.200, The word "extend" must be replaced with "extent" in Section 525.160 of the MRP.

R645-301-121.200, Reference to a ground survey being needed to verify subsidence damage in Sections 525.160 and 525.321 must be removed from the text. The Permittee is responsible for any subsidence damage whether or not they conduct a ground survey. For example if subsidence was suspected of damaging a spring a ground survey may not be the proper method to verify the claim.

R645-301-121.300, The Permittee must submit the subsidence information in the format required by the Division. The format used by the Permittee in the subsidence section of the amendment does not correspond to the format in the Utah Coal Rules Revised May 1, 1988. The May 1, 1988 rules were superseded by the November 1, 1996 rules.

For example the November 1, 1996 do not have sections R645-301-525.131, R645-301-525.132, R645-301-525.133, R645-301-525.134, R645-301-525.140, R645-301-525.150, R645-301-525.160, R645-301-525.170 while the PAP does.

Section 525.200 of the PAP discusses subsidence control, while Section R645-301-525.200 of the November 1, 1996 rules deals with protected areas. Section 525.300 of the PAP discusses notification of surface owners, while Section R645-301-525.300 of the November 1, 1996 rules deals with subsidence control.

The PAP does not address Sections R645-301-525.400, R645-301-525.460, R645-301-525.470, R645-301-525.480, R645-301-525.490, R645-301-525.500, R645-301-525.540, R645-301-525.550, R645-301-525.600, and R645-301-525.700,

Note: The Division will supply the Permittee with a hard or electronic copy of the current Utah Coal Rules upon request. The Permittee can get a current electronic copy of the Utah Coal Rules at http://161.119.62.173/mining/rulecoal.htm or visit the Division's homepage at http://dogm.nr.state.ut.us/

R645-301-332,Section 525.100, There are no renewable resource lands within the proposed addition to the permit area; however, according to the definition of renewable resource lands and information in the land use chapter of the application, the proposed addition to the permit area does include renewable resource lands. The Permittee must state that renewable resources are located in the permit area.

R645-301-332, The applicant needs to show how the effects of underground mining on vegetation will be monitored.

SLIDES AND OTHER DAMAGE

Regulatory Reference: 30 CFR Sec. 817.99; R645-301-515.

Analysis:

The Permittee committed to phone the Division if a slide occurred. The Division would then be informedof the remedial plan.

If the Division believed the remedial plan inadequate they would tell the Permittee what additional step were needed.

The Permittee committed to report any potential hazards of impoundments that are found during an inspection.

Findings:

The Permittee met the minimum requirements of this section.

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

Analysis:

Protection and enhancement plan.

In Section 333, the application says the major impacts to wildlife in and around the mine will be the loss of habitat during construction. It also says most wildlife will either accept the mine or adjust behavior to coexist with the operation. These statements need to be modified. Operational impacts, such as collisions with mine-associated vehicles, loss of habitat during the life of the mine, wildlife disturbance, and fragmentation of nearby habitat, may be more difficult to quantify but are greater than construction impacts.

The Fish and Wildlife Service commented that the mine's disturbance would kill most burrowing animals and others that are less mobile. It would also result in habitat fragmentation and dislocation of some animals to less desirable or already-occupied areas. Although wildlife can coexist with mining operations, animals may be forced to adjust their behaviors and may be otherwise stressed in ways that reduce their chances for survival

The applicant has committed to train mine employees annually on environmental awareness. This will include wildlife protection measures, such as avoidance during stress periods, caution in driving, and recognition of threatened or endangered species. The wildlife education program needs to specifically include instructions to remove wildlife carcasses well off the road to avoid collisions with scavenging raptors.

The applicant needs to make a definitive commitment regarding firearm and off road vehicle use in its area of control. In Section 323.300, the application indicates there could be possible restrictions on firearms on the mine site as well as restrictions on off road vehicle use. In Section 333.200, the application says the employee education program will include instructions on legal requirements for firearm and off road vehicle use.

All suitable water encountered during mining will be discharged in a manner that it becomes available to wildlife. The applicant will need to ensure the water rights allow for this use and that the water quality is suitable. The water rights listed in Table 7-2 indicate the uses are for "mining" and "other." Ensuring that water quality is suitable should be possible through testing required for the discharge permit.

The application discusses the possible benefits of water in the sediment pond to wildlife. In the event water in the pond contains materials hazardous to wildlife, it would be removed and the pond monitored to ensure no negative effects on wildlife.

According to the application, the Lila Canyon Mine has agreed to mitigate loss of wildlife habitat as well as the potential loss of habitat use during construction. This mitigation is under advisement with Wildlife Resources and the Bureau of Land Management The mitigation is expected to offset adverse effects on bighorn sheep, mule deer, elk, and chukars.

This commitment is considered acceptable, but the mitigation plan will need to be included in the application. Wildlife Resources indicates there are bighorn sheep that spend all year in the Lila Canyon area, and use by sheep is expected to be curtailed following construction. Wildlife Resources also commented that Lila Canyon, and more particularly the water sources up the canyon, are heavily used by chukars, and they feel the mining operations will affect these birds. They suggested the applicant install some watering structures of a suitable design and said these water sources would greatly benefit chukars and other area wildlife. This is a reasonable mitigation measure and is considered within the definition of "best technology currently available" to enhance wildlife habitat.

Endangered and threatened species.

The Fish and Wildlife Service has determined that water depletions from the Upper Colorado River Basin may affect four listed threatened or endangered fish species. Mitigation is required when the annual depletion exceeds 100 acre-feet. According to information in the Probable Hydrologic Consequences statement, the total annual water use is expected to be 21.3 acre-feet. Since the mine is not expected to use more than 100 acre-feet, no mitigation should be required.

The Fish and Wildlife Service commented in a letter dated April 14, 1999, that there should be an evaluation of effects on the Colorado pikeminnow (formerly the Colorado squawfish) of a water

discharge line to the Price River. This discharge line was apparently proposed early in the planning process for the mine, but it is no longer being planned.

It is impossible to fully evaluate potential effects on raptors without enough information about the nests in the vicinity of the mine. However, the Division has obtained an enhanced version of the 1998 raptor survey map from the Division of Wildlife Resources, and there are about three golden eagle nests within 250 yards of the proposed disturbed area. One of the nests is only about 260 feet from the proposed disturbed area. It appears the proposed facilities are in clear view of the nests, and, because of the proximity, it is almost certain they would not be used during the life of the mine.

The applicant commits to establish a one-half mile buffer zone of no disturbance during critical nesting periods. While this is adequate to protect eggs and chicks from abandonment, it is not adequate as a mitigation or enhancement plan for nests that will probably not be used during the life of the mine. It is possible the applicant will need to obtain "take" permits from the Fish and Wildlife Service, particularly for those nests close to the proposed facilities area.

Section 323.300 of the application says a consultation with the Fish and Wildlife Service and Wildlife Resources is scheduled for the fall of 1999. Line of sight and potential mitigation will be discussed during this meeting, and the results will be incorporated in Appendix 3-5. This is the type of coordination needed, but until the application contains a complete protection or mitigation plan, it remains deficient.

In Section 358.200, the applicant commits to conduct a raptor survey to ensure that no bald or golden eagles, their eyries, or their young would be adversely affected by mining-related activities. This statement needs to apply to all raptors, not simply bald and golden eagles.

Section 358.200 also contains a commitment to safeguard any escarpment that has been identified as a nest site for raptors; however, comparing Plate 5-5 with Plate 3-1 and the maps in Appendix 3-5, it appears at least one nest would be undermined. Because of the difficulty in reading the maps, it is not certain where the nests are located in relation to the proposed mining. This is the reason for requiring a map showing both the mine plan and nest locations (see requirements under R645-301-322). The commitment to safeguard escarpments that contain nests is adequate if it is reflected in the mine plan.

It appears no listed or proposed threatened, endangered, or sensitive species are in the area or would be adversely affected by mining. As discussed under R645-301-322, the application needs additional information about what surveys were done, but there are no indications any of these species is present.

R645-301-358.510 requires that the operator ensure that power lines used for or incidental to coal mining and reclamation operations within the permit area be designed, constructed and maintained to minimize electrocution hazards to raptors. The application contains a commitment to this effect. The Fish and Wildlife Service recommends application of power line designs such as those in the Avian Power Line Interaction Committee's "Mitigating Bird Collisions with Power Lines: the State of the Art in 1994," or "Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 1996," prepared for the Edison Electric Institute/Raptor Research Foundation, Washington, D. C.

Wetlands and habitats of unusually high value for fish and wildlife.

The application says the proposed disturbed area contains critical winter range for deer and elk, but it does not contain a specific protection or enhancement plan. Other operators have mitigated for similar disturbances by working with the Division of Wildlife Resources to enhance habitat on nearby lands. The "Protection and Mitigation Plan" section of this review discusses this issue further.

According to the application, there are no wetlands or riparian areas within the proposed addition to the permit area. While there are a few springs in the area, there are no perennial drainages.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

R645-301-333, In Section 333, the application says the major impacts to wildlife in and around the mine will be the loss of habitat during construction. It also says most wildlife will either accept the mine or adjust behavior to coexist with the operation. These statements need to be modified since the major impacts on wildlife from the mine will be associated with operations.

R645-301-333, The wildlife education program needs to specifically include instructions to remove wildlife carcasses well off the road to avoid collisions with scavenging raptors.

R645-301-333, The applicant needs to make a definitive commitment regarding firearm and off road vehicle use in its area of control.

R645-301-333, The Division of Wildlife Resources commented there are bighorn sheep that spend the entire year in Lila Canyon, and the mine will adversely affect these animals. In addition, the area is heavily used by chukars, and this use would also be negatively affected. The applicant needs to show how it will mitigate for effects on critical big game and other habitat and show how negative effects will be minimized. Wildlife Resources suggests the applicant install at least one artificial watering device, such as a guzzler, to benefit chukars in the area.

R645-301-333, The applicant has committed to consult with the Fish and Wildlife Service and Division of Wildlife Resources concerning the eagle nests near the proposed facilities. The application needs to contain the results of this consultation, including protection and mitigation plans.

R645-301-333, The application says a raptor inventory will be conducted to ensure that no bald or golden eagles or adversely affected by mining, but this statement needs to apply to all raptors.

R645-301-333, The applicant has committed to not subside escarpments that contain eagle nests, but it appears the area near at least one nest would be subsided. The applicant needs to show how nests in the subsidence areas would be protected. Additionally, it is very difficult using the maps in the application to determine where nests are located in relation to the proposed mining activities, but this problem is addressed under R645-301-32 n this review.

While the access road and power lines will probably not be regulated by the Division, the Division of Wildlife Resources and Fish and Wildlife Service commented on these facilities. It is very important that power lines be designed and constructed in accordance with the most current technology to avoid electrocutions. The poles will be used by golden eagles, ferruginous hawks, and other raptors.

Many big game animals are killed in collisions with vehicles used to haul coal, and it is vital that drivers be instructed on the importance of maintaining proper speeds and watching for wildlife. Any animals killed must be taken well off the road to avoid scavengers, including eagles, being hit. They should also be reported to Wildlife Resources.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Chapter 2, Soils, Sections 230 through 234, discusses the soil's operation plan for the proposed Lila Canyon Mine. Topsoil protection uses traditional methods of salvaging and stockpiling. The plan contains no measures for subsoil protection. The Analysis section discusses operation information as follows:

- Topsoil and Subsoil Removal
- Topsoil Substitutes and Supplements
- Topsoil Storage

Topsoil and Subsoil Removal

The following three points are summarized concerning topsoil and subsoil removal:

The plan proposes salvaging 43,000 cubic yards of topsoil with an average salvage depth of eight inches.

The proposed 43,000 cubic yards of topsoil salvage does not meet the reclamation needs within the Lila Canyon Mine disturbed area.

Reclamation needs are determined by revegetation requirements and include:

1. Replacing rooting-depth subsoils. Rooting-depth subsoil is defined as the subsoil depth containing many to common fine to very fine roots. These depths vary from 6 to 48 inches across the site, depending on the soil as shown in the Order 1 soil survey.

2. Covering the refuse pile and mine development waste-rock with four feet of best available material.

3. There are adequate salvageable soil resources available within the disturbed area to meet reclamation needs, but the plan does not propose salvaging these currently undisturbed and available soil materials.

Reclamation Needs - Soil Replacement Volumes

Soil Replacement Reclamation Needs	Acres	Soil Depth (inches)	Soil Volume (cubic yards)
Rock Slope Storage	3.28	40&	17,639
Refuse Pile	1.69	40&	9,088
Topsoil*	38.95^	8	41,893
Rooting Depth Subsoil** XBS	8.89^	4&	4781
Rooting Depth Subsoil** RBL	7.01^	0&	0
Rooting Depth Subsoil** RBT	0.9^	-2&	-242
Rooting Depth Subsoil** SBG	7.8^#	40&	41,947
Rooting Depth Subsoil** DSH	1.56^	18&	3,775
Rooting Depth Subsoil** VBJ	9.51^	10&	12,786
Total			131,667

* Since the A horizons are less than six inches, the plan has identified topsoil as 8 inches.
** Subsoil (> 8 inches) containing many to common fine and very fine roots.
^ Excludes undisturbed islands
# Excludes rock slope storage area
& Does not include the 8 inch topsoil placement.

Available Soil Resources - Soil Salvage Volumes

The order 1 soil survey identifies 140,789 cubic yards of soil available for salvage from the site which more than adequately supplies the soil volumes needed to meet reclamation needs (131,667 cubic yards).

Based on DOGM guidelines and the Order 1 soil survey, Appendix 2-3 identifies and quantifies Topsoil suitable for reclamation. As summarized, soil salvage estimates are broken down according to soil survey map units. Based on the entire area within the disturbed area boundary, the Order 1 soil survey identified 157,600 cubic yards of available soil for salvage from 49 acres to an average depth of 24 inches. Several undisturbed islands are proposed and effectively reduce the disturbed acreage; of the 49 acres within the disturbed boundary, 39 acres are proposed to be disturbed. Therefore, the PAP identifies 140,789 cubic yards of available soil for salvage from 38.95 acres. The following table for salvage areas, acreage, depth of salvage and available volumes was :

Topsoil Areas and Available Salvage Volumes

Map Unit	Salvage (inches)	Acres	Volume (yd3)
SBG	48	11.08	71,501
VBJ	30	9.51	38,336
XBS	12	8.89	14,307
DSH	40	1.56	8,373
RBL	8	7.01	7,543
RBT	6	0.90	729
Total		38.95	140,789

Potential salvage depths were generated for each map unit based on evaluations of all field and laboratory data, and plant rooting depth. Soil salvage areas are broken down by soil survey map units and are identified on the Salvageable Soils Map, Appendix A2 of Appendix 2-3, Order 1 Soil Survey. The Salvageable Soils Map shows each soil survey map unit, soil description sites, and potential salvage depths. Depths of suitable soil material potentially available for soil salvage from each of the soil units within the surface disturbance area are listed in the following table as compared to rooting depth and subsurface rock content:

Map Unit	Salvageable Soil Layer (inches)	Many to Common Fine Roots Rooting Depth (inches)	Subsurface Rock Within Soil Salvage Layer (percent)
SBG	48	48	10 to 65
VBJ	30	18	5 to 65
XBS	12	12	25 to 40
DSH	40	26	<5 to 45
RBL	8	not listed	30
RBT	6	6	35

Topsoil Salvage Practices

State regulations R645-301-232.100 are specific in requiring that all topsoil be removed from the area to be disturbed. Since the topsoil is less than six inches, the PAP defines "Topsoil" as suitable soil for plant growth, generally, the upper 6 to 12 inches that consist of both the A and B horizon materials. Therefore, topsoil salvage will include the topsoil and the B horizon material immediately below the topsoil and the mixture will be treated as topsoil. Section 232.100 of the PAP concludes that actual topsoil salvage will average 8 inches over the 40 acres of disturbed area, which will result in a total volume of about 43,000 cubic yards of soil. Large stones and boulders are considered part of the soil layer and are included in the topsoil volume estimates. Plate 2-3 shows an average of 8 inches being salvaged across the site. Topsoil salvage will occur under the supervision of a soil scientist.

Topsoil salvage at the proposed exhaust fan site located near the coal outcrop will be stored on-site, in the immediate disturbance area for fan installation. The proposed fan site is at an elevation of about 6400 feet and is located on a narrow bench, with a slope of about 40 to 45 %. The soil survey identifies an approximate salvage depth of 6 inches for the RBT soils.

Topsoil salvage sequence will generally start at the lower elevations of the site and then proceed up slope ahead of construction. The PAP shows the undisturbed islands within the disturbed area where no surface disturbance will occur; and therefore, no topsoil salvage will occur in these areas. The PAP needs to identify what measures will be made during the life of the mine to protect undisturbed topsoil resources from mining related impacts, such as blowing coal fines, vehicle traffic, and other uses that would disturb and/or otherwise negatively impact these undisturbed areas and topsoil resources.

Subsoil Segregation and Salvage Practices

PAP Section 232.100 states that after topsoil removal, underlying subsoil will be used as fill or left in place. Below the upper 6 to 12 inches of topsoil, there is generally an increase in carbonates and rock. The PAP states that although these lower subsoils support plant roots, they are not

considered as substitute topsoil in this case. Below the possible salvageable depths as listed for each soil, there is generally an additional large increase in rock content, upwards to 70 and 80 percent rock. Within the RBL and RBT soil areas, Mancoes is encountered immediately below the shallow soils. In no case, should Mancoes be salvaged with the overlying soils.

State R645-301-200 regulation states that soil salvage includes both the surface topsoil and subsoils as based on the soil survey and re-vegetation requirements. R645-301-232.500 states that the Division may require that the B horizon, C horizon, or other underlying soils be removed and segregated, stockpiled, and redistributed as subsoil if it finds that such subsoil layers are necessary to comply with the re-vegetation requirements of R645-301-353 through R645-301-357. Salvage of subsoils is based on subsoil replacement rooting depth and soil suitability criteria established in the Order 1 soil survey.

Adverse Conditions

Sections 232.700 and 232.710 state that topsoil can be salvaged on areas to be disturbed. Local exceptions may exist where topsoil can not be salvaged because of rockiness and/or steep slopes. The PAP needs to specifically discuss and identify areas on the soil salvage map where conditions exist that preclude soil salvage due to rockiness and/or steep slopes. If steep slopes are accessible to construction machinery for constructing cutslopes, soils are expected to be salvaged. On extremely bouldery surfaces planned for disturbance, underlying soils are expected to be salvaged. Either steep, rocky surface slopes are safe for constructing cut slopes and likewise soil salvage, or they're not safe for either activity. If steep, rocky slopes and extremely bouldery surface materials render themselves suitable for constructing purposes using conventional construction equipment, (e.g., cutslopes, sediment pond basins, and pad fill), then these same indigenous soil and rock material from the unconsolidated steep, rocky surfaces can be salvaged and stockpiled for later reclamation use.

There is no clear and obvious presentation in the PAP where cut and fill slopes will occur as described in the text. The PAP needs to provide a cut and fill contour map and correlate discussion from both operation and reclamation activities.

Rocks - Boulders and Large Stones

Robert Davidson's discussion concerning salvaging soils with higher rock content has been misrepresented in the Appendix 2-3, Section 2.5, Soil Suitability For Salvage. The general idea is to salvage otherwise suitable soil containing indigenous amounts of rock that are typical within the soil salvage area. The main idea is that native soils with a higher intrinsic rock content than Division guideline deems acceptable, offer a greater potential for reclamation success as follows:

1. Allow a greater potential for moisture infiltration into the interstitial soils
2. Provide for a more stable reclaimed surface
3. Provide additional surface cover in sparsely vegetated areas, thus helping protect against rain drop impact and resulting soil surface erosion
4. Create wildlife habitat niches
5. Create micro-climates for plant establishment and vegetation survival.

The PAP appendix 2-3 states that surface stones and boulders in the soil that are present during salvage operations, could be removed to a rock pile on site and held there until replacement. Protection of topsoil resources include salvaging "native soils" with "intrinsic or indigenous rock content." Section 232.100 states that boulders of approximately three feet in diameter and larger will be separated from the topsoil and piled or placed at appropriate locations. Clarify the following in the PAP:

- Designate a "topsoil" rock stockpile on maps where salvaged rock will be stored for reclamation use.
- "Topsoil" rock stockpiles need to be appropriately signed and protected during life of mine.
- Or, include rock with soil salvage and store with soil in topsoil stockpile.

Topsoil Substitutes and Supplements

Sections 224, 231.200, 232.720, 233, and 233.100 thru 233.400 state that no topsoil borrow nor substitute topsoil is needed.

Rock Slope Material

Using R645-100, the rock slope material is by definition Underground Development Waste which is by definition Coal Mine Waste. All Coal Mine Waste must be properly disposed of in a Refuse Pile. A Refuse Pile means a surface deposit of coal mine waste that does not impound water, slurry, or other liquid or semi-liquid material. Underground Development Waste is Defined by R645-100 as waste-rock mixtures of coal, shale, claystone, siltstone, sandstone, limestone, or related materials that are excavated, moved and disposed of from underground workings in connection with Underground Coal Mining and Reclamation Activities. Therefore, the rock slope waste material must be identified as Underground Development Waste and disposed of properly as a Refuse Pile.

Refuse Piles

The PAP states that the refuse pile will be covered with 24 inches of subsoil and 8 inches of topsoil, for a total of 32 inches. Since this is not a case of pre-law disturbance without enough suitable soil resources, the plan must provide for a minimum of 48 inches of cover using the best available material according to the requirements of R645-301-533.252. The Order 1 soil survey shows that adequate soil resources are available to attain the needed volume of soils, which are the best available material. Therefore, enough topsoil and subsoil need to be salvaged and stockpiled to meet the 4 foot cover requirement for both the rock-slope refuse pile and the main refuse pile.

Section 232.500 and Appendix 5-7 state subsoil will be removed from RBL area to minimum depth of 24 inches. The Order 1 soil survey, test pit LC10, shows that topsoil cover is approximately 6 to 8 inches and that immediate subsoils 6 inches and greater in depth contain 65 to 80 percent Mancos shale fragments. Only suitable topsoil and subsoil may be salvaged and used for reclamation; Mancos has not been approved for salvage.

Topsoil Storage

The application states that the topsoil stockpile will be located and protected to avoid contamination and unacceptable compaction. The plan further states that the slopes will have an irregular, pitted surface or contour furrows to help retain precipitation and minimize runoff. The following are needed:

- Soil scrappers have been shown to induce soil compaction. State how compaction will be alleviated.

- Section 234.230 states that surface roughening will consist of contour furrows and constructing an irregular, pitted surface. These two practices are not compatible. Commit to using one or the other exclusively. If contour furrows are used, engineer furrow placement, slope, and size to control erosion; provide contour furrow design, maps, and cross sections.

The application, Section 232.100, contains information concerning topsoil pile size and dimensions. However, additional information is needed as follows:

- Topsoil Stockpile - Size the topsoil to store the 43,000 CY of topsoil as identified in the PAP.

- Subsoil Stockpile - Size the subsoil pile to store the additional 98,000 CY of subsoil as identified in the PAP. Provide the location and placement of the subsoil stockpile.

- Stockpiles - Provide engineered drawings of projected stockpiles, showing size, exact placement, final configuration and cross sections of each stockpile. Details are needed for the following stockpiles:
  - topsoil stockpile,
  - subsoil stockpile, and
  - "topsoil" rock (boulders and large stones) stockpile.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. The applicant must provide the following in accordance with:

R645-301-232.100 through R645-301-232.500, The total volume of soil needed for reclamation (131,667 cubic yards) will require salvaging and protecting most of the available topsoil and rooting-depth subsoil resources within the disturbed area as identified in the Order 1 soil survey. All topsoil and rooting-depth subsoil resources must be protected and/or preserved for reclamation. Topsoil and rooting-depth subsoils may not be mixed or contaminated with unsuitable soil materials containing excess rock or Mancoes shales.

R645-301-333, Identify what measures will be made during the life of the mine to protect the island of undisturbed topsoil resources from mining related impacts, such as blowing coal fines, vehicle traffic, and other uses that would disturb and/or otherwise negatively impact these undisturbed areas and topsoil resources.

R645-301-232.700 and R645-301-232.710, Identify specific areas inaccessible for construction machinery where soils can not be salvaged due to adverse, unsafe or impractical conditions. All soils must be salvaged on steep slopes and/or rocky areas accessible to construction machinery for the purpose of constructing cut slopes or grading flat areas.

R645-301-120 and R645-301-140, Clearly identify, locate, and present where cut and fill slopes will occur as described in the text. Provide a cut and fill contour map correlated with discussions from both the operations and reclamation sections.

R645-301-231.100 through R645-301-232.300, and R645-301-234.100 through R645-301-234.240, Section 232.100, states that boulders of approximately three feet in diameter and larger will be separated from the topsoil and piled or placed at appropriate locations. The following need clarification in the PAP:

- Designate a "topsoil" rock stockpile on maps where salvaged rock will be stored for reclamation use, and sign these piles accordingly during the life of the mine.

- Or, include rock with soil salvage and store with soil in topsoil stockpile.

R645-301-100 (Underground Development Waste, Coal Mine Waste, Refuse Pile), R645-301-528.200 through R645-301-528.322, and R645-301-536 through R645-301-536.900, Identify the rock-slope waste material as Underground Development Waste. Place and properly dispose of all Underground Development Waste in a Refuse Pile. If Underground Development Waste is used as pad fill, then the pad fill must meet the permit requirements for an approved disposal area.

R645-301-553.252, The PAP states that the refuse pile will be covered with 24 inches of soil. Correct the PAP so that the refuse pile, upon final grading is covered with a minimum of four feet of the best available, nontoxic and noncombustible material.

R645-301-553.252 and R645-301-233, Section 232.500 and Appendix 5-7 state subsoil will be removed from RBL area to minimum depth of 24 inches. The Order 1 soil survey, test pit LC10, shows that topsoil cover is approximately 6 to 8 inches and that immediate subsoils 6 inches and greater in depth contain 65 to 80 percent Mancos shale fragments. Only suitable topsoil and subsoil

may be salvaged and used for reclamation; Mancos has not been approved for salvage.

R645-301-234.220 through R645-301-234.230, The application states that the topsoil stockpile will be located and protected to avoid contamination and unacceptable compaction. The plan further states that the slopes will have an irregular, pitted surface or contour furrows to help retain precipitation and minimize runoff. The following are needed:

- Soil scrappers have been shown to induce soil compaction. State how compaction will be alleviated.

- Section 234.230 states that surface roughening will consist of contour furrows and constructing an irregular, pitted surface. These two practices are not compatible; commit to using one or the other exclusively. If contour furrows are used, engineer furrow placement, slope, and size to control erosion; provide contour furrow design, maps, and cross sections.

R645-301-234.200 through R645-301-234.240, R645-301-521.160, R645-301-521.165, Additional information is needed concerning soil stockpile pile size and dimensions.

- Topsoil Stockpile - Size the topsoil to store the 41,893 CY of topsoil as identified in the PAP.

- Subsoil Stockpile - Size the subsoil pile to store the additional 89,774 CY of subsoil as identified in the PAP. Provide the location and placement of the subsoil stockpile.

- Stockpiles - Provide engineered drawings of projected stockpiles, showing size, exact placement, final configuration and cross sections of each stockpile. Details are needed for the following stockpiles:
  - topsoil stockpile,
  - subsoil stockpile, and
  - "topsoil" rock (boulders and large stones) stockpile.

VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

Analysis:

Section 331 says, "The permit effected [sic] area is approximately 40.77 acres of which only 39.86 acres will be disturbed." The definition of affected area in R645-100 includes all areas above underground workings, so it does not appear the applicant has used the correct term in Section 331. The applicant needs to explain this statement.

The second paragraph in Section 331 says the disturbed drainage area contains approximately 40 acres but that less than 22 acres will actually be removed from production as a result of the mine. The remaining 18 acres will be available for continued wildlife use. This section is confusing. Although areas planted with interim vegetation may have some value to wildlife, the entire disturbed area will essentially be lost for wildlife habitat through the life of the mine.

All incidental disturbances that will not be used as part of the operations will be revegetated with an interim seed mix. Table 3-5 is an interim seed mix that includes three introduced and four native species.

According to Section 357.220, the lowest parts of the mine plan area, described as the areas with the greatest disturbance and assumed to be the proposed disturbed area, receive nine inches of annual precipitation while the upper elevations receive 14 to 16 inches. According to Section 724.411, the proposed mine site is in an area with annual precipitation of about 12 inches. It is impossible to determine whether the revegetation plan is adequate when the application contains conflicting information such as this, but the Division has attempted to review the revegetation plan with the information available.

Table 3.4/3.5 is a seed mix for interim and final reclamation. According to a footnote, grass or forbs only would be used for interim revegetation. Forbs alone would not be expected to provide adequate cover to control erosion, and the seeding rate for the grasses alone is low. The Division makes the following recommendations for this seed mix:

1. Include both grasses and broadleaf forbs.

2. Reduce the seeding rate for yellow sweet clover and flax.

3. Add a rhizomatous grass that is adapted to the area. Based on the precipitation data available, it appears the most adapted species would be western wheatgrass and thickspike wheatgrass.

Section 331 refers to the revegetation plan in Section 340 for further information about revegetation methods. The details of this plan are discussed under "Revegetation" below.

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to approval, the applicant must provide the following in accordance with:

R645-301-331, The applicant needs to clarify the use of the terms affected area and disturbed area. Also, the discussion in the second paragraph of Section 331 about how much land might be available for wildlife use is confusing and may be unnecessary.

R645-301-724.400, The application contains conflicting precipitation information, and this needs to be resolved.

R645-301-331, Grasses or forbs only would be seeded for interim revegetation, but the broadleaf forbs would not provide adequate erosion protection and the seeding rate is minimal for the grasses alone. Both should be used together, and the Division recommends certain changes to the seeding rates and species being seeded.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Analysis:

Road Systems

Road Classification System

The Permittee states in Section 527.200 that all roads for the Lila Canyon project are shown on Plate 5-2. All of the mine roads shown on Plate 5-2 are classified as primary roads. No ancillary roads are associated with the Lila Canyon project. The information about road classification systems meets the minimum requirements of this subsection.

Plans and Drawings

In Section 527.200 of the amendment the Permittee states that detailed designs and descriptions for each road within the permit area are included in Appendix 5-4 and all roads are shown on Plate 5-2. Appendix 5-4 does not contain information about the road embankment safety factor. The road embankment stability analysis is in Appendix 5-5.

Appendix 5-5 has information about slope stability for the roads. The Permittee state that a slope stability analysis was done for the road embankment and road cut slope. The Permittee did not state where the cross section that was used for the stability analysis was located, nor did the Permittee give the Division a copy of that cross section.

The Permittee used the Hoek method for calculating slope stability factors. The stability analysis shows that the road embankment and cut slope are stable. The Hoek method is valid only for slopes with homogeneous soils. The Permittee must show that the Hoek method is valid because the site conditions meet the assumptions of the Hoek method.

Appendix 5-4 has a drawing labeled "Typical road section". The drawing is an enlargement of part of the area identified as 12+00 to 20+00 on Plate 5-2. There is no scale on the drawing nor does the drawing have any design.

The Permittee does not propose to locate a road in the channel of an intermittent or perennial stream. The Permittee met the minimum requirements of this section.

The Permittee does not propose to locate a temporary ford in the channel of an intermittent or perennial stream. The Permittee met the minimum requirements of this section.

The Permittee does not propose to alter or relocate a natural stream channel.

The Permittee does not propose a low-water crossing of a perennial or intermittent stream channel.

The Permittee states in Section 542.600 that there will be no roads within the mine facilities permitted area. All roads will be reclaimed upon cessation of mining.

Performance Standards

Without plans and drawings for the roads the Division is unable to determine if the proposed roads will meet the performance standards.

Primary Road Certification

The road plans and cross sections in Appendix 5-4 were not certified by a register professional engineer. The only map that shows road information that was certified was Plate 5-2, which shows general road information.

Other Transportation Facilities

The Permittee states in Section 527.200 that the detailed design for conveyor is included in Appendix 5-4. There is no information about conveyors in Appendix 5-4.

Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-527.200, The Permittee must give the Division the cross sections that were used in the embankment stability analysis and also state why the assumption used in the Hoek method were valid. The assumption used in the construction of the charts area:

1. The mateial forming the slope is assumed to be homogeneous
2. The shear strength of the material is characterized by a cohesion c and a friction angle φ.
3. Failure is assumed to occur on a circular failure surface which passes through the toe of the slope.
4. A verticle tension crack is assumed to occur in the uper surface of in the fae of the slope.

5. The location of the tension crack is assumed and of the failure surface are such that the factor of safety of the slope is a minimum for the slope geometry and groundwater conditions considered.

R645-301-527.200, The Permittee must give the Division plans for each surface conveyor.

R645-301-527 and R645-301-534, The Permittee must give the Division certified plans and drawings for the roads in the Lila Canyon area. The plans are drawing in Appendix 5-4 are not certified. In addition, the plans and drawings must contain the following information:

1. Include a map, appropriate cross sections, design drawings, and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures;

2. Describe the plans to remove and reclaim each road that would not be retained under an approved postmining land use, and the schedule for this removal and reclamation.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Disposal of noncoal waste.

The Permittee showed the general location where noncoal waste would be stored on Plate 5-2. The Division needs the Permittee to be more specific about the location. The exact location of the permanent noncoal waste storage areas must be shown on Plate 5-2. If the noncoal waste storage facilities are moveable dumpsters then the Permittee must describe the dumpsters including the general location of where they will be placed in the PAP.

In Section 528.332 the Permittee states that final disposal of noncoal mine wastes except for concrete will be disposed in an area designed and constructed to ensure that leachate and drainage does not degrade surface or underground water. The Permittee also states that all noncoal mine waste except for concrete will be shipped to ECDC for final disposal.

The Division usually allows an operator to dispose of concrete on site. The on site disposal of concrete is usually done by placing the concrete in areas that will be backfilled and graded. The

Division usually requires that at least 4 feet of material is place over the concrete to allow for proper vegetation growth. The Permittee must show where the concrete will be disposed and how the area will be reclaimed.

If the Permittee wants to dispose of non coal waste on site other than concrete the Permittee must specify where the material will be placed during final reclamation and show that the requirements of R645-301-528.332 are meet.

Permanent disposal of noncoal waste at the ECDC facility is approved by the Division. The Division wants to inform the Permittee that there may be more cost effective areas to dispose of noncoal waste. Since the disposal fees for building debre can often be the single biggest demolition expense the Permittee may want to look at alternative sites before reclamation.

Coal mine waste.

The Permittee states in Section 528.320 that coal mine waste will be placed in new or existing disposal areas within the permit area. The Division is not aware of any existing disposal areas within the permit area where coal mine waste could be place. The Permittee must clarify this statement.

The Permittee did not show that the refuse pile will have a static safety factor of 1.5 as required by R645-301-536.110.

The Permittee states in Section 520 that the rock material removed from the rock slopes will be used as fill material. The rock material is coal mine waste and must be place in an approved facility (R645-301-528.320). If the Permittee wants to use the rock material for fill then the fill areas must be approved disposal sites (refuse piles) and meet the design requirements of R645-301-536.

Refuse piles.

The plan for the refuse pile is in Appendix 5-7. The Permittee states that 24" of subsoil and topsoil will be placed over the refuse pile during final reclamation. The Permittee did not state the thickness of the topsoil. R645-301-553.252 requires that 4 feet of material be place on a refuse pile unless the Division approve a lesser amount. The refuse pile designs must show 4 feet of cover unless the Division approves a lesser amount. Until the Permittee meets those requirements the refuse design is considered inadequate.

The slope stability analysis for the refuse pile is in Appendix 5-5. The slope is shown to have a safety factor of 2.9 for dry conditions and 2.0 for saturated conditions. The Permittee did not give the detailed cross section that was used in stability analysis.

Impounding structures.

The Permittee does not propose to construct any impoundments from coal mine waste.

Burning and burned waste utilization.

The plan to extinguish coal mine fires is in Appendix 5-3. The plan is adequate.

Return of coal processing waste to abandoned underground workings.

The Permittee does not propose to dispose of coal mine waste underground.

Excess spoil.

The Permittee does not anticipate that any excess spoil will be generated.

Findings:

R645-301-528.332, The Permittee must give the Division a detailed plan for the on site storage of noncoal mine waste. The Permittee must state where in the permit area all noncoal waste will be temporarily stored. If portable dumpsters are used the Permittee must show the general locations on the surface facilities map and give a description in the PAP of how the dumpsters will be used. The Division usually allows concrete to be used as backfill material provided the concrete is adequately cover. The Permittee needs to show the location of the on site concrete disposal areas and describe how the concrete will be placed and covered.

R645-301-528.320, The Permittee must identify all existing disposal areas were coal mine waste will be disposed. If no existing disposal areas exist then the Permittee must remove the reference to existing disposal areas from the PAP.

R645-301-528.320 and R645-301-536, The Permittee must place all rock material from the rock slopes into approved disposal areas. If the Permittee wants to use the material from the rock tunnels as fill material for the pad then the Permittee must permit the area as a refuse pile.

R645-301-553.252, The Permittee must either commit to cover the refuse pile with 4 feet of material or demonstrate to the Division that a lesser amount is needed.

R645-301-536.100, The designs for the refuse pile must include the detailed cross sections that were used for stabiltiy analysis. The detailed cross section and failure surface are needed to verify that the assumptions used to determine the safety factor are valid.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521,

-301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Ground-water monitoring.

Ground-water monitoring will be conducted according to the ground-water monitoring plan in Section 731.210 of the MRP; the Technical Analysis of that plan, including deficiencies, is in the Hydrologic Resource Information section of this TA and is not repeated here.

Operational ground-water monitoring sites are listed in Table 7-3 and locations are shown on Plate 7-4. Six seeps and spring ground-water monitoring sites, L-6-G through L-11-G, are proposed: they will be monitored quarterly for parameters listed in Table 7-4. Water levels will be measured quarterly in wells IPA 1, 2, and 3. Station L-5-G is the potential mine discharge point and will be monitored monthly or as frequently as discharges occur, in accordance with UPDES Permit requirements.

A-26 and A-31 were bored as offsets to S-26 and S-31 to observe ground-water levels in the alluvium south of the Williams Draw Fault. Table VI-3 does not indicate that these wells have been plugged and abandoned; however, the applicant has no data on A-26 and A-31 (Section 6.5.1 - p. 21). S-32 was drilled in 1981 and completed as a piezometer in the Grassy Member of the Blackhawk Formation. The applicant considers these three wells unusable (Section 724.100).

Ground-water monitoring data are to be submitted every three months to the Division. Sections 731.212 of the PAP contains a commitment from the applicant that when the analysis of any ground-water sample indicates noncompliance with the permit conditions, the operator will promptly notify the Division and immediately take the actions provided for in 145 and 731; this appears to be a reference to Sections R645-301-145 and -731 of the Coal Mining Rules.

Ground-water monitoring will continue through mining and reclamation until bond release. If ground water is encountered in future mining in a quantity that requires discharge, it will be monitored in accordance with requirements of section 731.210, and a monitoring plan will be proposed at that time. It is not clear from the PAP how long baseline monitoring will be continued and when operational ground-water monitoring will begin.

The permittee commits in Section 731.215 that equipment, structures and other devices used in conjunction with monitoring the quality of ground water on-site and off-site will be properly installed, maintained and operated and will be removed by the operator and will be removed by the operator when no longer needed.

Surface-water monitoring.

Locations of all monitoring sites are shown on Plate 7-4 , "Water Monitoring Location Map".

Proposed monitoring methods, parameters and frequencies are described in Table 7-3, "Water Monitoring Stations", and Table 7-4, "Water Monitoring Parameters".

Monitoring reports will be submitted to the Division at least every 3 months, within 30 days following the end of each quarter.

The proposed surface-water monitoring plan is detailed in Section 731.220. This plan is based on PHC determination and analysis of all baseline hydrologic, geologic and other information in this permit application. The plan provides for monitoring of parameters that relate to the suitability of the surface water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance as set forth in 751 (see Table 7-4).

Discharges of water from this operation will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U. S. Environmental Protection Agency set forth in 40 CFR Part 434. See Sections 731 and 742.

The surface-water monitoring parameters are shown in Table 7-4. Water monitoring locations and sample frequencies are described in Table 7-3 and on Plate 7-4 .

Table 7-3
Lila Canyon Mine
Water Monitoring Stations

Station	Location	Type	Frequency	Remarks
L-1-S	Lila Canyon	Int. Stream	Monthly	
L-2-S	Rt. Fork Lila (above mine)	Ephemeral Stream	Monthly	
L-3-S	Lila Canyon (below mine)	Int. Stream	Monthly	
L-4-S	Sediment Pond	Discharge	Monthly or as occurs	Per UPDES Permit
L-5-S	Mine Water	Discharge	Monthly or as occurs	Per UPDES Permit
L-6-G	Lila Canyon	Spring	Quarterly	Mont Spring Sample Site H-21
L-7-G	Lila Canyon	Spring	Quarterly	Leslie Spring Sample Site H-18
L-8-G	Little Park	Spring	Quarterly	Cottonwood Spring Sample Site 9
L-9-G	Little Park	Spring	Quarterly	Unnamed Spring Sample Site 10

Table 7-3
Lila Canyon Mine
Water Monitoring Stations

Station	Location	Type	Frequency	Remarks
L-10-G	Little Park	Spring	Quarterly	Pine Spring Sample Site 22
L-11-G	Willows Draw	Spring	Quarterly	Unnamed Spring Sample Site 13-A
IPA-1	Little Park	Borehole	Quarterly	Water Level Only
IPA-2	Little Park	Borehole	Quarterly	Water Level Only
IPA-3	Little Park	Borehole	Quarterly	Water Level Only

Table 7-4 Lila Canyon Mine Water Monitoring Parameters	
Field Measurements	
Water Level or Flow	Surface and Ground
pH	Surface and Ground
Specific Conductivity (ohms/cm)	Surface and Ground
Temperature (Oc)	Surface and Ground
Dissolved Oxygen (ppm) (Perennial streams only)	Surface - Perennial Only
Laboratory Measurements (mg/L)	
**Total Settleable Solids	Surface and Ground
Total Suspended Solids	Surface Only
Total Dissolved Solids	Surface and Ground
Total Hardness (as CACO3)	Surface Only
Acidity (CaCO3)	Surface Only
*Carbonate (CO3 -2)	Surface and Ground
*Bicarbonate (HC)3 -1)	Surface and Ground
*Calcium (Ca)	Surface and Ground
Chloride (Cl -)	Surface and Ground
Iron (Fe)	Surface and Ground
*Magnesium (Mg)	Surface and Ground
*Total Manganese (Mn)	Surface and Ground
*Potassium (K)	Surface and Ground
*Sodium (Na)	Surface and Ground
*Sulfate (SO4 -2)	Surface and Ground
***Oil and Grease	Surface Only (Below Mine)
Cation - Anion Balance	Surface Only (Below Mine)

Table 7-4 Lila Canyon Mine Water Monitoring Parameters	
* Dissolved Form ** UPDES Samples Only *** Designated Samples Only	

Surface-water monitoring will be conducted according to the ground-water monitoring plan in Section 731.220 of the PAP; the Technical Analysis of that plan, including deficiencies, is in the Hydrologic Resource Information section of this TA and is not repeated here.

Operational surface-water monitoring sites are listed in Table 7-3 and locations are shown on Plate 7-4. The proposed surface-water monitoring program will monitor Lila Canyon both above and below the disturbed mine site area at L-1-S, L-2-S, and L-3-S. The sediment pond discharge at L-4-S and the potential mine discharge point L-5-S at will be monitored in accordance with UPDES Permit requirements. No monitoring is proposed for Little Park Wash, which appears to be the major surface drainage in the permit area.

Streams will be monitored monthly. Sediment pond and mine discharges will be monitored monthly or as frequently as discharges occur.

Point-source discharge monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Environmental Health for Utah Pollutant Discharge Elimination System (UPDES) permits. A UPDES discharge permit application has been submitted to the Division of Environmental Health for the proposed sediment pond and mine water for the Lila Canyon operation. A copy of the UPDES permit application is provided in Appendix 7-5.

Monitoring reports will be submitted to the Division at least every three months, within 30 days following the end of each quarter (Section 731.220). When analysis of any surface water sample indicates noncompliance with the permit conditions, the company will promptly notify the Division and immediately take actions to identify the source of the problem, correct the problem and, if necessary, to provide warning to any person whose health and safety are in imminent danger due to the noncompliance (Section 731.223).

Surface-water monitoring will continue through mining and reclamation until bond release. It is not clear from the PAP how long baseline monitoring will be continued and when operational ground- and surface-water monitoring will begin.

The applicant commits in Section 731.225 that equipment, structures and other devices used in conjunction with monitoring the quality of surface water on-site and off-site will be properly installed, maintained and operated and will be removed by the operator and will be removed by the operator when no longer needed.

The applicant proposes in Section 731.121 that surface-water quality protection is to be accomplished by the plan described in Section 731 and the following methods:

1. Minimizing surface disturbance and proper handling of earth materials to minimize acidic, toxic or other harmful infiltration to ground-water systems;
2. Testing (as-necessary) to ensure stockpiled materials are non-acid and non-toxic;
3. Controlling and treating disturbed area runoff to prevent discharge of pollutants into surface-water, by the use of diversions, culverts, silt fences, sediment ponds, and by chemical treatment if necessary;
4. Minimizing and/or treating mine water discharge to comply with UPDES discharge standards;
5. Establishing where surface-water resources exist within or adjacent to the permit area through a baseline study and monitoring quality and quantity of significant sources through implementation of a Water Monitoring Plan;
6. Proper handling of potentially harmful materials (such as fuels, grease, oil, etc.) in accordance with an approved Spill Prevention Control and Countermeasure Plan (SPCC).

Acid and toxic-forming materials.

Underground development waste will be stored in a designated area. Such waste will be tested for acid- or toxic-forming potential, and if found to be acid- or toxic-forming, the waste site will be protected from surface runoff by the use of earthen berms (Section 731.312).

All storage, burial and treatment practices will be as described in this permit and consistent with applicable material handling and disposal provisions of the R645-Rules (Section 731.320).

Transfer of wells.

There are presently three monitoring wells on this permit. When these wells are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations.

Discharges into an underground mine.

There are no plans to discharge any water into an underground mine.

Gravity discharges.

The proposed access portals are below the coal outcrop, as shown on Plates 5-2 and 7-5. The fan is to be located above the outcrop. The two 1,227 foot long slopes will slope up at approximately 12%, from a starting elevation of approximately 6150'. The intersection of the coal seam and the rock slope will take place at approximately 6,300 feet elevation. Maximum ground-water elevation measured in the three IPA wells was 5,972 feet, and maximum projected elevation in the vicinity of the rock-slope tunnels is approximately 6,000 feet (Plate 7-1), so the likelihood that the rock slopes will intercept ground water in the regional aquifer is small.

Surface entries and accesses of drift mines are to be located so as to prevent or control gravity discharge from the mine. There is no cross section showing location and extent of ground water and its relation to geologic structure and stratigraphy. There is no cross section showing the relationship of the rock tunnels to the structure, stratigraphy, and ground water.

The numbers provided in the PAP indicate ground-water levels would need to rise approximately 150 feet just to reach the starting elevation of the tunnels (from 6,000 feet to 6,150 feet) and 300 feet to reach the intersection of the tunnels with the coal seam (from 6,000 feet to 6,300 feet). The applicant states in Section 731.521 that the water level in the mine would need to rise approximately 20 feet to reach the contact of the rock slope with the coal seam and produce a gravity discharge through the tunnels: it is not clear what this means.

Water quality standards and effluent limitations.

Any discharge from the sediment pond will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434. A copy of the UPDES permit application is in Appendix 7-5.

Diversions.

There is one undisturbed diversion planned for this site. This diversion consists of a bypass culvert beneath the sediment pond, which will allow undisturbed runoff to bypass the site without mixing with disturbed area runoff.

Other diversions planned consist of disturbed area ditches and culverts, as shown on Plate 7-5. Design details for all diversions are provided in Appendix 7-4.

All diversions will be constructed and maintained to comply with the requirements of R645-301-742.100 and R645-301-742.300. Details are described under those respective sections of this chapter.

Culvert details are provided in Appendix 7-4. All undisturbed culvert inlets will be provided with headwall protection, consisting of inlet sections, rock or concrete.

Stream buffer zones.

No development or disturbance will take place within 100 feet of a perennial stream.

Sediment control measures.

Sediment control measures within and adjacent to the disturbed areas are detailed in Appendix 7-4. These measures include, but are not limited to:

As discussed in Appendix 7-4, runoff from the disturbed area will be captured in a sediment pond and/or treated as necessary to meet effluent limitations prior to discharge.

Undisturbed diversions will consist of properly designed and protected channels and/or culverts as described in Appendix 7-4.

The primary means of velocity reduction is planned to be the use of rip-rap; however, other methods such as straw dikes, check dams and/or vegetative filters may be employed during the operational or reclamation phases as determined necessary, and with Diversion approval.

Siltation structures.

As described in Appendix 7-4, the only siltation structures planned for this operation are a sediment pond and possible minor, temporary sediment traps such as straw dikes and/or catch basins.

Siltation structures will be designed, constructed and maintained in accordance with the following regulations.

Sedimentation ponds.

The general plan for this site is to drain runoff from the disturbed area into a single sedimentation pond for treatment prior to discharge. Site drainage and design details are described in Appendix 7-4. The general plan includes the following, at a minimum:

The sediment control plan and proposed sediment pond designs have been prepared and certified by a Registered Professional Engineer, State of Utah.

Sediment pond locations, design plans and cross sections are provided on Plates 7-5 and 7-6 , respectively.

The pond is designed to contain the runoff from a 10 year - 24 hour precipitation event for the area in addition to a minimum of 2 years of sediment storage. See "Sediment Pond Construction Requirements" in Appendix 7-4;

The proposed pond is not located where failure would expect to cause loss of life or serious property damage. As shown in Appendix 7-4, the proposed pond embankment will have a minimum of 3H : 1V on the inside slope and 2H : 1V on the outside. These slopes, along with the 95% compaction requirement, will ensure a static safety factor in excess of 1.3, as required.

All discharges from sedimentation ponds, diversions and culverts will be protected from erosion by the use of adequately sized rip-rap, concrete or other approved protection. Details for outlet protection for all drainage control structures are provided in appendix 7-4. All discharge structures have been designed according to standard engineering design procedures.

Other treatment facilities.

Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to:

Prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area;

Exemptions for siltation structures.

No exemptions requested by the applicant.

Discharge structures.

The Principle Spillway culvert is a corrugated, metal pipe, and the open channel spillway is proposed to be constructed of grouted rip-rap. Each one designed to carry sustained flows.

The sediment pond emergency spillway will be constructed of grouted rip-rap for erosion and velocity control. (See Appendix 7-4).

Diversions and culvert outlets that are expected to have flow velocities in excess of 5 fps will also be equipped with erosion and velocity controls as described in Appendix 7-4.

Impoundments.

The Permittee proposes to construct only one sediment pond, that will be located in the southeast corner of the disturbed area (See Plate 5-2). The sediment pond will have a maximum storage capacity of 12 acre feet and a height of 11 feet. Therefore the pond does not meet the criteria for an MSHA pond.

The Permittee had the sediment pond design certified by Dan Guy, who is a registered professional engineer.

In Appendix 5-5 the Permittee shows the results of the safety factor analysis. The lowest safety factor is 2.35 for the cut slopes under saturated conditions. The safety factor exceeds the 1.3 requirement. The Permittee must show the cross sections and failure surfaces that were used to determine the safety factors. That information is needed to verify the assumptions used to determine the safey factor.

The Division's hydrologist will determine if the impoundment has adequate freeboard to resist overtopping by waves and by sudden increases in storage volume.

The Permittee did not include not include the analysis of the physical and engineering properties of the foundation materials. The Permittee must include that information in the MRP. See R645-301-533.210

The Permittee states in Appendix 5-5 that the pond is protected against sudden drawdown. The Permittee list four reasons why the pond is protected against sudden drawdown. None of the reasons explain why the pond would be protected against pore pressure in the embankment due to rapid drawdown. The Permittee must supply the Division with additional information about how the pond is protected against sudden drawdown. See R645-301-533.300.

The Permittee states that the pond design was approved by the State Engineers Office. The Permittee must give the Division a copy of the State Engineers approval letter. See R645-301-521.190.

The Permittee committed to have the external slopes of the impoundment will be planted with an approved seed mix to help prevent erosion and promote stability. The Division biologist and hydrologist will review the vegetation plan.

The Division's hydrologist will determine if the spillways are properly designed.

There are no highwalls associated with the impoundment.

The Permittee committed to conduct inspections as stated in the Utah Coal Rules.

Casing and sealing of wells.

There are no wells planned for the Lila Canyon Mine; however, if any wells are installed in the future, they will be permanently sealed in accordance with Section 765 of the Coal Mining Rules (Section 765).

Findings:

Operation Plan Hydrologic Information is not considered adequate to meet the requirements of this section. Prior to approval the applicant must provide the following information:

R645-301-731.521, The numbers provided in the PAP indicate ground-water levels would need to rise approximately 150 feet just to reach the starting elevation of the tunnels (from 6,000 feet to 6,150 feet) and 300 feet to reach the intersection of the tunnels with the coal seam (from 6,000 feet to 6,300 feet). The applicant states Section 731.521 that the water level in the mine would need to rise approximately 20 feet to reach the contact of the rock slope with the coal seam and produce a gravity discharge through the tunnels: it is not clear what this means.

R645-301-731.210, It is not clear from the PAP how long baseline monitoring will be continued and when operational ground- and surface-water monitoring will begin.

R645-301-533.700, The Permittee must label the contour lines on Plate 7-6. The Permittee must also show the correct location of the emergency spillway on the contour maps. The elevation of the emergency spillway is shown between 5839 and 5841 feet on Plate 7-6. The table shows the elevation to be 5841 feet.

R645-301-533.100, The Permittee must give the Division the detailed cross sections that were used in the slope stability analysis. Those cross sections are needed

R645-301-533.210, The Permittee give the Division the physical and engineering properties of the sediment pond foundations.

R645-301-533.300, The Permittee must show how the pond will be protected against sudden drawdown. Specifically the Permittee must show that pore pressure in the embankments will not cause the pond to fail should a sudden drawdown occur.

R645-301-521.190, The Permittee must provide the Division with a copy of the letter from the State Engineer stating that the sediment pond design has been approved.

R645-301-731, The applicant should size the undisturbed drainage culvert in Lila Canyon to account for floods, debris, sediment load and overflow from sedimentation pond. The sizing calculations should incorporate a curve number value from antecedent moisture condition III, since the culvert will be used during reclamation and visited infrequently.

R645-301-222, The applicant should submit contingency plan to treat groundwater in the event contaminated groundwater is contacted in volumes that have to be discharged from the mine.

R645-301-752, The applicant should commit to evaluating channel morphology parameters and erosion impacts if mine water should be discharged into Lila Canyon.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

Analysis:

The Permittee committed to install and operate all utility installations and support facilities are required by R645-301-526.200.

Findings:

The Permittee met the minimum requirements of this regulation.

SIGNS AND MARKERS

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

Analysis:

The Permittee committed to place signs and markers are required by the Utah Coal Rules.

Findings:

The Permittee met the minimum requirements of this section.

USE OF EXPLOSIVES

Regulatory Reference: 30 CFR Sec. 817.61, 817.62, 817.64, 817.66, 817.67, 817.68; R645-301-524.

Analysis:

The Division reviewed the general blasting information and found it adequate. R645-301-524.220 allows the permittee to submit a specific blasting plan separate from the MRP. The Permittee has opted to submit a detailed blasting plan later.

Findings:

The Permittee met the minimum requirements of this section. Under the requirements of R645-301-524.200 the Permittee opted to submit the specific blasting plan as a separate submitle. The Division approved the Permittee's request to submit the blasting plan as a separate submitle.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Affected area maps.

Plate 5-5 shows the areas where mining is expected to occur. Plate 5-2 shows the area that is scheduled to be disturbed. The Division found deficiencies in those maps. Details of the deficiencies are in other sections of the TA. The deficiencies are listed below.

The general area hydrology is identified in Plant 7-1. Plates 5-1 and 7-4 identify the effected area for the Lila Canyon Mine.

Mining facilities maps.

Plate 5-2 shows the mine facilities. The Division has reviewed the map and some deficiencies that are listed below. Details for the deficiencies are listed in other sections of the TA.

Mining facilities maps.

The following is a list of cross-sections and maps provided in this section of the P.A.P.

Plate 7-1	Permit Area Hydrology Map
Plate 7-2	Disturbed Area Hydrology/Watershed
Plate 7-3	Water Rights Locations
Plate 7-4	Water Monitoring Location Map
Plate 7-5	Proposed Sediment Control Map
Plate 7-6	Proposed Sediment Pond
Plate 7-7	Post-Mining Hydrology

Mine workings maps.

The Mine working map is located on Plate 5-5. The map contains a legend that details site information. The map also identifies the mining sequence.
Monitoring and sample location maps.

Monitoring and sample location maps.
Operational ground-water and surface-water monitoring sites are listed in Table 7-3 and locations are shown on Plate 7-4. The proposed surface-water monitoring program will monitor Lila Canyon both above and below the disturbed mine site area at L-1-S, L-2-S, and L-3-S. The sediment pond discharge at L-4-S and the potential mine discharge point at L-5-S will be monitored in accordance with UPDES Permit requirements. No monitoring is proposed for Little Park Wash, which appears to be the major surface drainage in the permit area. Seven seeps and spring ground-water monitoring sites, L-6-G through L-11-G, are proposed: they will be monitored quarterly. Water levels will be measured quarterly in wells IPA 1, 2, and 3.

The relationship of these springs to seeps and springs monitored previously by JBR Consultants, EarthFax Engineering, and others is not clear. The names do not correspond to those used in gathering earlier data, and locations on Plate 7-4 do not clearly correspond with locations on Plate 7-1. Deficiencies in the Monitoring and Sampling Location Maps are identified under Maps, Plans, and Cross Sections in the Resource Information section of this TA and are not repeated here.

All cross sections, maps and plans required by R645-301-722 as appropriate, and R645-301-731.700 have been prepared and certified according to R645-301-512 (Section 712).

Findings:

R645-301-528.100, The Permittee must show the coal storage areas on the surface facilities maps. The Permittee will only be allowed to store coal in those coal storage areas outlined on the surface facilities map. The Permittee must also label the coal loading and transportation areas.

R645-301-525.490, The Permittee must show on Plate 5-5 or other similar maps those areas where subsidence control methods (first mining only) will be used to

protect surface structures such as escarpments, seeps and springs and eagle nests.

R645-301-525.100, The Permittee must provide the Division with a map of the permit area at a scale of 1:12,000 or larger that shows the areas where subsidence could occur.

R645-301-527 and R645-301-534, The Permittee must provide the Division with certified plans and drawings for the roads in the Lila Canyon area. The plans and drawings must contain the following information:

Include a map, appropriate cross-sections, design drawings, and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures.

RECLAMATION PLAN

GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The postmining land uses will be the same as premining land uses. This will be accomplished through the reclamation plan presented in other sections of the application. Support activities to achieve the postmining land use will include site monitoring; remedial actions, such as regrading, reseeding, and replanting; and fencing as necessary to restrict access and grazing.

The postmining land use is in accordance with the Bureau of Land Management's management plans. Appendix 4-2 contains a letter from the Bureau of Land Management stating the postmining land use for the area is wildlife habitat, grazing, and incidental recreation.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

In Section 512.260 the Permittee states no variance from the approximate original contours is requested.

Findings:

The Permittee met the minimum requirements of this section.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

In Section 537.200 the Permittee states:

Slope rock meeting non-toxic, non-acid criteria will be used to fill in some low areas to be used as pads in the coal pile storage areas. See Plate 5-2. The slope rock material meeting non-toxic, non-acid criteria will be left in place for final reclamation. The area will be covered with material and re-seeded as per Chapters 2 and 7 and section 540.

The R645-301-537.200 regulations apply only to existing fills. Since the site has not been disturbed, the Division cannot allow the Permittee to use the R645-301-537.200 regulation to obtain a variance from the AOC requirements.

In Section 553.120 the Permittee states that all spoil piles, highwalls and depressions except small depression used for water collection will be eliminated. The Permittee does not plan to have spoil piles. A profile of one reclaimed highwall is shown on Plate 5-7C. However, the specific portal is not identified. The Permittee needs to give the Division profiles for all three portals and the portals must be identified in the drawings.

In Section 553.130 the Permittee states that all fill slopes will have a static safety factor of 1.3. The Permittee does not reference any slope stability studies that show the reclaimed slopes will have a static safety factor of 1.3. Appendix 5-5 has slope stability analysis, but none of those studies involve reclaimed slopes.

The Permittee will control erosion by constructing burms, channels, silt fences, pock marks, soil tackifiers, and mulch. All runoff will flow to the sediment pond for treatment before leaving the disturbed area.

The Permittee states that all coal seam and combustible materials will be adequately covered. The Permittee must specify where and what materials will be acid or toxic forming and where they will be disposed.

The Permittee states, in Section 553.410 of the PAP, that cut and fill terraces that may occur will be in association with that portion of the mine portal pads that will be excavated into ledge rock and as such will not be reclaimed to original contours. In Section 553.420 of the PAP the Permittee states that no terraces will be required for post mining land use. The Permittee must be consistent.

The Permittee committed to compact all recontoured areas and then place 3 inches of topsoil or soil substitute material and rip on the contour to a depth of 12 to 18 inches. In addition the area will be pockmarked to reduce the potential for erosion. Most machinery cannot operate on the contour on slopes greater than 5H to 1V. The Division is not sure how the Permittee can rip on the contour on steep slopes.

Findings:

R645-301-537.200, The Permittee states in Section 537.200 of the PAP that material from the rock slopes will be left in place during final reclamation as settled and revegetated fill. The settled and revegetated fill regulation deal with materials placed before the enactment of SMCRA. Since the site is undisturbed, the Division will not allow the Permittee to leave settled and revegetated will in place if that material does not meet AOC requirements.

R645-301-553.120, In Section 553.120, The Permittee states that all highwalls will be eliminated. However, the Permittee did not give the Division detailed maps and cross sections of the portal areas. Without that information the Division cannot make a finding about the adequacy of the highwall elimination plan. The Division needs a cross section of profile of each portal. The portals must be identified on the cross sections.

R645-301-553.130, In Section 553.130, The Permittee states that all reclaimed slopes will have a static safety factor of at least 1.3. The Permittee did not provide the slope stability analysis that supports the 1.3 safety factor claims.

R645-301-553.300, In Section 553.300, The Permittee states that all coal seams and/or combustible material will be adequately covered to prevent spontaneous combustion. However, the Permittee does not state what or where that material is located. The Permittee must clarify the statements about covering coal seams and other combustible materials.

R645-301-553.400 and R645-301-121.200, The Permittee states, in Section 553.410 of the PAP, that cut and fill terraces may be used to reclaim the mine portal pads. The Permittee then states in Section 553.420 that no terraces will bed used. The Permittee needs to present consistent information.

R645-301-553.230, The Permittee states that all recontoured areas will be compacted to reduce soil slippage and the have 3 inches of topsoil placed. After the topsoil is placed, the soil will be ripped on the contour. The Permittee must explain how areas with slopes to steep to allow equipment to operate on the contour will have topsoil placed.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

The Permittee committed in Section 529 of the PAP to seal all underground openings when no longer needed according to Division requirements. Appendix 5-6 has plans for portal sealings. The portals will be sealed according to Division and MSHA requirements.

Mine entries that are temporarily inactive, but has a further projected useful service under the approved permit application, will be protected by barricades or other covering devices, fenced, and posted with signs, to prevent access into the entry and to identify the hazardous nature of the opening. These devices will be periodically inspected and maintained in good operating condition by the person who conducts the activity.

Findings:

The Permittee met the minimum requirements of this section.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

Chapter 2, Soils, Sections 240 through 244, discusses the soil's reclamation plan for the proposed Lila Canyon Mine. The Analysis section discusses reclamation information as follows:

- Soil Redistribution
- Soil Nutrients and Amendments
- Soil Stabilization

Soil Redistribution

The Permit Application Package describes the steps taken for reclamation. Reclamation will begin once all surface facilities and structures have been demolished and removed. Cut areas will be backfilled and graded to approximate original contour (AOC) using fill material taken from pad fill areas. Reclamation of slopes will take place in vertical increments (lifts) simultaneously with the reclamation of the pad area in corresponding lifts. The adjacent hillside will be reclaimed and revegetated. Furthermore, the plan states that much of the revegetation efforts on these slopes can

be accomplished by using the adjacent pad fill areas as a work platform for equipment and materials. The following are needed:

- The location of cut and fill slopes is not clear. Please provide a cut and fill contour map to correlate with the discussion concerning backfilling cut slopes from adjacent pad areas.

- Clarify which adjacent pad areas (located within the disturbed area) will be used as work platforms for backfilling cut slopes and newly exposed hillsides.

- The statement that the adjacent reclamation pad area will be reclaimed in corresponding lifts is unclear since the pad is being removed, not built up.

Section 242 states that after AOC is achieved, the surface will be prepared. Pocking will be the primary method for roughening the AOC surface. Pocking is described as imprinting the soil surface with a pattern of depressions measuring approximately 18 inches by 24 inches by 8 inches deep. This would be an absolute minimum for pock size. The best available technology will be used for enhancing the ability of the soil to absorb moisture. Clarification is needed as follows:

- Describe whether Pocking will occur before or after topsoil placement.

- Describe the density of pock placement on the soil surface.

Section 242.100 states that previously stockpiled topsoil will be redistributed on the same areas in a uniform thickness of approximately 8 inches on the scarified, postming regraded fill surface. On flat areas, soil will be reapplied using road grader and/or crawler tractor. On steep slope areas, soil will be reapplied using a front-end loader, crawler tractor, and/or trackhoe. Soil will be applied in horizontal lifts. Boulders will be replaced to achieve a near natural surface condition. Alleviating or minimizing soil compaction is not discussed. The following are needed:

- A description of methods for minimizing and alleviating compaction of fill and replaced subsoil and topsoil.

- A description of methods for reducing soil slippage between the fill and soil interface.

- A plan for the reincorporation of stockpiled rock (boulders and large stones) with the redistributed topsoil.

Soil Nutrients and Amendments

Sections 231.300 states that topsoil will be sampled, as it is hauled from the storage piles, and tested for nitrogen, phosphorus and potassium content. One grab samples will be taken from each truck load. Field measurements will be used for pH and EC parameters to allow immediate identification of salinity problems and acid problems. If problems are identified in the field, additional sampling will better define the extent and nature of the problem. Section 243 states that topsoil will be sampled and tested prior to replacement. Grab samples will be collected from the stockpile at various locations and depths. Section 231.300 and 243 are not in complete agreement on topsoil

sampling procedures. Sections 231.300 and 243 refers to topsoil field sampling and testing. Please ensure that all sampling, testing and result interpretation is done by a qualified soil scientist. The soil scientist must be qualified to sample, test and interpret data results. Prior to sampling and testing of the topsoil material, the soil scientist's qualifications must be reviewed by the Division.

Section 243 states that based on laboratory analyses, nutrients and soil amendments will be added to make the redistributed soil similar to the undisturbed soils and aid in establishment of vegetation cover. The plan states that the nutrients and amendments can be added by hydroseeding, broadcasting, or by drilling. If the nutrients and amendments are broadcast to the ground surface, they will be mixed with the soil by discing or raking. Drilling, discing or raking are not compatible with extreme rocky soils, rocky surfaces, or with surfaces that have been deep gouged or pocked. Correct the plan to indicate surface preparation practices that are compatible with the rocky soil and surfaces, and that are consistent with other reclamation practices (e.g., pocking).

Soil Stabilization

Section 244.100 states that vegetation will be the primary method for controlling erosion and fugitive dust. Other measures that will help in erosion control and soil stabilization is pocking and rock placement.

Section 244.200 states that pocking will be the primary method used to roughen the soil surface. In addition, wood fiber mulch will be applied at a rate of 2,000 pounds per acre to the reclaimed areas that have been regraded and covered by topsoil or substitute topsoil. The wood fiber mulch will be tacked to the surface with a tackifier.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. The applicant must provide the following in accordance with:

R645-301-120, The following items are needed to help add clarity and eliminate discrepancies in the plan:

- The location of cut and fill slopes is not clear. Please provide a cut and fill contour map to correlate with the discussion concerning backfilling cut slopes from adjacent pad areas.
- Clarify which adjacent pad areas (located within the disturbed area) will be used as work platforms for backfilling cut slopes and newly exposed hillsides.
- The statement that the adjacent reclamation pad area will be reclaimed in corresponding lifts is unclear since the pad is being removed, not built up.

R645-301-242, R645-301-244, Clarify and describe soil redistribution, placement, and stabilization:

- Describe whether Pocking will occur before or after topsoil placement. Describe the density of pock placement on the soil surface.

- Describe methods for minimizing and alleviating fill and replaced subsoil and topsoil compaction.

- Describe methods for reducing soil slippage between the fill and soil interface.

- Describe how stockpiled "topsoil" rock (boulders and large stones) will be placed on the surface and reincorporated with the redistributed topsoil.

- Correct the plan to indicate surface preparation practices that are compatible with the rocky soil and surfaces, and that are consistent with other reclamation practices (e.g., pocking). Drilling, discing or raking are not compatible with extreme rocky soils, rocky surfaces, or with surfaces that have been deep gouged or pocked.

R645-301-130, Section 231.300 and 243 are not in complete agreement on topsoil sampling procedures. Sections 231.300 and 243 refers to topsoil field sampling and testing. Please ensure that all sampling, testing and result interpretation is done by a qualified soil scientist. The soil scientist must be qualified to sample, test and interpret data results. Prior to sampling and testing of the topsoil material, the soil scientist's qualifications must be reviewed by the Division.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

The Permittee committed to reclaim all roads including removal of bridges and culverts in the disturbed area. The road surfaces will be removed and buried on site and covered with a minimum of two feet of material. The roads will be ripped and top soiled before seeding.

Findings:

The Permittee met the minimum requirements of this section.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Ground-water monitoring.

There is no specific reclamation ground-water monitoring plan. Ground-water monitoring, if implemented, will continue through mining and reclamation until bond release (Section 731.214).

Surface-water monitoring.

There is no specific reclamation surface-water monitoring plan. Surface-water monitoring will continue through mining and reclamation until bond release (Section 731.224).

Acid and toxic-forming materials.

Any material which exhibits acid- or toxic-forming characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material.

Transfer of wells.

There are no wells planned for the Lila Canyon Mine; however, if any wells are installed in the future, they will be permanently sealed in accordance with Section 765 of the Coal Mining Rules (Section 765).

Discharges into an underground mine.

No discharges planned to underground mines.

Gravity discharges.

Section 731.520 explains why gravity discharges from the mine are not expected after mine closure.

The coal seam to be mined dips away from the portal site at approximately 10%. If water is encountered in the mining, it will likely be at a static level far below the exposed outcrop or rock slopes. This may result in some possible mine discharge from pumping, but not from gravity.

Water quality standards and effluent limitations.

A reclamation surface and groundwater was not submitted.

Diversions.

All disturber and undistrubed area diversions will be removed during the backfilling and recontouring reclamation period.

Stream buffer zones.

There will be no development within 100 feet of a perennial stream

Sediment control measures.

Upon completion of operations, the disturbed area will be reclaimed. All drainage and sediment controls are considered temporary and will be removed when no longer required. The sediment pond will remain in place until Phase II Bond Release requirements have been met. At that time, the pond will be removed and the area will be reclaimed in accordance with the approved plan.

Upon removal of the sediment pond, the area will be regraded and revegetated in accordance with the approved reclamation plan.

Siltation structures.

See Appendix 7-4 for details on removal of siltation structures.

As indicated in Section 761, the sediment pond will remain in place until the stability and vegetation requirements for Phase II Bond Release are met. This will be a minimum of 2 years after the last augmented seeding. At this time, the pond will be removed and the area reclaimed.

Sedimentation ponds.

The proposed sediment pond is considered temporary, and will be removed during final reclamation. The pond is designed in compliance with the requirements of the following sections, as required:

The pond will be maintained until the disturbed area has been stabilized and revegetated. Removal shall not be any sooner than 2 years after the last augmented seeding;

Upon removal, the pond area will be reclaimed and reseeded according to the reclamation plan.

Impoundments.

No impoundments will be left on site after reclamation.

Casing and sealing of wells.

There are no wells planned for the Lila Canyon Mine; however, if any wells are installed in the future, they will be permanently sealed in accordance with section 765 of the Coal Mining Rules (Section 765).

Findings:

R642-742.312, The applicant should discuss how the large undisturbed culvert will be reclaimed and how much will be left in-place to provide for flows under the roadway.

R645-742.312, All reclaimed channels or other hydrologic structures should be designed using Antecedent Moisture Condition III, which yields a higher Curve Number value to ensure maximum protection of hydrologic features while unattended.

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

There have been no plans presented for contemoraneous reclamation.

Findings:

The applicant should discuss any plans or desires to implement contemporaneous reclamation during mining operations.

REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

General requirements.

Table 3-3 in Chapter 3 is a general reclamation timetable, and an explanation of some terms is given in Appendix 5-8. This timetable shows phases of reclamation, and there are some problems that should be resolved.

1. It is not clear what "Lower Area 2" is.

2. A logical sequence would be to complete reclamation activities beginning at the top of the site and working down. According to Table 3-3, earthwork would be done first in the lower area then on the road and pad. With this sequence, it might be necessary to build an access road across the regraded area and to grade this area again.

3. It is not clear where and in what sequence seeding and mulching listed for September 1, 2025, and September 30, 2025, would occur.

4. Table 3-3 indicates seeding and mulching could begin as early as September 1, but seeding of most species should be delayed until as late in the fall as possible.

5. Blue grama and galleta are two of the dominant grasses, and they are both warm season grasses. Other mines have had a great deal of difficulty getting these species to be established on reclaimed sites, and this may be because they are often seeded in the fall. Mines in New Mexico and Arizona usually seed these species in the summer to take advantage of late summer rains. The applicant needs to show how warm season grasses will be established, and it is recommended these species be seeded in the summer with the rest of the seed mix being applied in the fall.

Following demolition, the area would be regraded to approximate original contour. Cut areas will be restored as yard fill is removed, and other areas will be backfilled and regraded using material from the adjacent pads. Fill will be placed in cuts in 18-24 inch lifts and compacted sufficiently to achieve structural stability. These areas will then be ripped 18 inches deep and disced. Topsoil will be redistributed in a uniform thickness of eight inches. According to Appendix 5-7, the refuse pile will be covered with 24 inches of subsoil before placing the eight inches of topsoil.

The topsoil redistribution plan is not adequate for reestablishing vegetation that meets the performance standards. The applicant proposes to distribute an average of eight inches of soil over the entire area at reclamation. Below this soil would be regraded fill.

There needs to be adequate topsoil and subsoil salvaged and protected to allow for revegetation to the performance standards in R645-301-350. Most species growing in the area need more than eight inches of growth medium to survive in this setting. The baseline soils information shows rooting depths of up to 48 inches. Deeper rooting depths are critical for continued water and nutrient extraction during periods of drought, and where less soil is available, productivity, density, and cover would be limited by these factors.

Any soils not salvaged and protected would be subject to contamination from mine operations, compaction, and mixing with unsuitable materials. Some of the deeper subsoils, below the roots, have very high (>65%) rock contents, and some are derived from marine shales that could severely limit vegetation establishment and growth. If these materials were in the rooting zone, it would be difficult or impossible to achieve revegetation success.

Surface preparation would include gouging to a depth of about eight inches. While this is a very desirable technique that has been used successfully at other Utah mines, the bottoms of the gouges would not have any topsoil if only eight inches of soil was put back.

Section 553.230 indicates only three inches of soil will be placed in some areas before being ripped and pocked. If three inches of soil was manipulated this much, it would be mixed in with the material below it to the point it would lose any value as topsoil. This plan is not acceptable.

Coal mine waste, including underground development waste, needs to be covered at least four feet deep with the best available nontoxic and noncombustible material unless physical and chemical analyses show revegetation success standards are met with less cover. To use coal mine waste as part of the four feet of cover, the applicant would need to demonstrate that this material is better as a growth medium than the subsoils on the site. Lacking physical and chemical analyses of the coal mine waste and lacking a demonstration that the coal mine waste is the best available growth medium, the applicant must show how these areas will be covered at least four feet deep with topsoil and subsoil.

Following topsoil redistribution, the soil will be tilled until the size of the average is less than one inch. Continuing to till the soil until soil clods are this small is not necessary or desirable in this kind of site. It might be necessary to break up the very largest clods, but this usually happens naturally as topsoil is redistributed.

The surface preparation, seeding, and mulching plans are not consistent throughout the application and are not presented in a way that it is possible to discern exactly what the plan is.

1. Appendix 5-8 and Section 244.200 both discuss gouging, but Chapter 3 does not. The Division agrees gouging is a desirable technique that has worked well at other Utah mines and is probably essential for establishing vegetation at Lila Canyon, but it is not clear how gouging would relate to other surface preparation methods. Chapter 3 says the surface will be covered with 2000 pounds per acre of alfalfa or native grass hay that will be crimp disced into the soil. Chapter 3 also discusses ripping the soil 18 inches deep. Crimp discing and ripping could be done before gouging but would reduce the effectiveness of the gouges if done afterward. Discing and ripping are probably unnecessary if the area is gouged. The applicant needs to clearly state the order in which these operations will occur.

2. Section 341.220 says the area will be either broadcast or drill seeded. Shrub species may be broadcast to avoid clogging the drill. Drill seeding is not compatible with gouging, and it also tends to favor grasses and decrease diversity. The revegetation section of Appendix 5-8 only mentions hydroseeding and does not mention drill seeding

3. Section 341.230 says straw mulch will be used on all inaccessible areas and that it will be anchored by crimping. If an area is inaccessible and would have straw applied, it would also be inaccessible to equipment needed to crimp the straw. The application does not say what mulching method or rate will be used in accessible areas. It also does not say at what rate the straw mulch would be applied. In addition, crimping, like drill seeding, is likely to reduce the effects of gouging. The applicant needs to

clarify the mulching methods and rates. Chapter 3 says an optional mulching method would be to hydromulch with 2000 pounds per acre of wood fiber, and Appendix 5-8 discusses hydromulching with wood fiber but does not mention using straw. Section 244.200 says wood fiber mulch will be applied at a rate of 2000 pounds per acre, but it does not mention straw. The Division recommends applying straw at a rate of about 2000 pounds per acre followed by wood fiber hydromulch and tackifier to anchor the straw.

Section 244.200 discusses gouging and describes the gouges as being about eighteen by twenty-four inches and eight inches deep. These are absolute minimum measurements. Gouges should normally be at least twelve inches deep. The application needs to indicate the measurements shown are minimum sizes rather than average or typical.

The applicant needs to describe how the gouges will be placed. The soil can be gouged so that virtually the entire area is covered by gouges, or the gouges can be spaced some distance apart. Covering the entire area is the most effective.

The seed mixture for final reclamation is shown in Table 3-4/3.5. It consists of fifteen species, eleven of which are native to the area. The introduced species are yellow sweet clover, small burnet, prostrate kochia, and Russian wild rye.

The applicant needs to either justify these introduced species as being desirable and necessary to achieve the postmining land use or eliminate them from the seed mix. R645-301-353.120 says reestablished vegetation will be comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the Division. The Division feels these species are probably not necessary to achieve the postmining land use. While some of these species have been used at reclaimed coal mines, there have generally been specific reasons for doing so.

The previously-proposed seed mix included bluebunch wheatgrass, but this desirable native species has been eliminated from the mix. This species fills a niche similar to that of the less palatable Salina wild rye which is one of the dominant grasses at the site, and the Division recommends it be included in the mix.

Seed of blue grama is readily available commercially, and this species should be included in the mix.

The seeding rate shown in Table 3-4 is high, about 256 seeds per square foot for broadcast seeding. The Interagency Forage and Conservation Planting Guide for Utah recommends broadcast seeding at a rate of about 50-100 seeds per square foot.

There will be no irrigation, and no pest or disease control measures are planned. The Division does not anticipate irrigation will be necessary as long as water harvesting methods are used. There are no serious pest control problems in the area of which the Division is aware, so, hopefully, no control measures will be necessary.

The application says in Section 357.301 the Lila Canyon Mine would like to reserve the right to apply for augmentation of reclaimed areas without jeopardizing or extending the bond liability period on a site specific case scenario. The regulations in R645-301-357 are designed to allow a limited amount of reseeding and other work for specific purposes without lengthening the extended liability period. These regulations define the limits of these practices where they are not considered augmentative. Augmented seeding is not allowed without lengthening the extended liability period; therefore, the statement in 357.301 must be modified.

Standards for success.

In this section, the application says the reference area for the mine site disturbance was established adjacent to the existing facilities during the summer of 1985. It appears this is a reference to the current Horse Canyon mining and reclamation plan. If the applicant intends to use the reference area at the Horse Canyon Mine, the application needs to include all pertinent data to compare the reference area with the proposed disturbed area.

As discussed in the "Vegetation Resource Information" section of this analysis, there is inadequate information to determine whether the reference areas shown in Appendix 3-2 can be approved as success standards for vegetation cover or other vegetation parameters. The applicant needs to propose methods for measuring diversity, seasonality, and erosion control and success standards for these parameters.

The Division is required in R645-301-356.230 to consult with the Division of Wildlife Resources and gain approval for the tree and shrub density standard for success. The standard set in consultation with Wildlife Resources is 1500 per acre. This standard needs to be included in the application.

The numbers of woody plants in the proposed disturbed pinyon juniper area are skewed because over half are Leptodactylon pungens, a subshrub. In the shrub/grass disturbed and reference areas, about two-thirds of the woody plants are green rabbitbrush, a small shrub that is not particularly desirable for forage. For these reasons, the standard was based more on the species expected to become established in the area than on the existing vegetation.

Field Trials

The application says the methods outlined have a proven performance based on the successful reclamation of the Horse Canyon Mine.

At this time, the Division does not anticipate it will be necessary to establish field trials. As the applicant clarifies the reclamation plan, the Division may decide revegetation methodologies need to be tested.

Wildlife Habitat

The application says the sediment pond will be maintained through the life of the operation and bond liability period at which time it will be allowed to pass through normal pond succession until such time as the pond will be removed when effluent criteria are met at about year six following

reclamation. This statement contradicts itself and at least one other section of the application. If the pond is to be maintained through the bond liability period, it will be functional after at least ten years, rather than six, following the last augmented seeding, irrigation, or other work. Stating that the pond will be allowed to pass through normal succession implies it will be allowed to silt in rather than being maintained.

Sections 761 and 763.100 indicate the sediment pond will remain in place until the stability and vegetation requirements for Phase II Bond Release are met and that this will be a minimum of 2 years after the last augmented seeding. At this time, the pond will be removed and the area reclaimed. As discussed above, Section 342 says the pond will remain for at least six years. The hydrology section of the application says nothing about allowing the pond to go through succession.

There is little doubt that a water source in this area would serve as a wildlife habitat enhancement. However, it is not known whether the pond would actually contain water a significant part of the year and would thus serve as an enhancement. It is also not known whether the water quality would be suitable for wildlife use. Even if it does contain water, the enhancement would only be temporary.

The applicant needs to clarify how long the pond will be allowed to remain and what maintenance will be done. Before the pond can be considered an enhancement, the applicant needs to demonstrate that water in the pond would be suitable for wildlife use.

As discussed above, Wildlife Resources feels the applicant should install a watering device in the area. The applicant should investigate whether additional methods would serve to enhance wildlife habitat after reclamation.

The species in the seed mixture, with the required changes, will potentially provide good forage and cover for wildlife. The application indicates the grouping of the plants will be in a manner which optimizes edge effect cover and gives other benefits to fish and wildlife. Because there will be no transplanting, the plants will not necessarily be grouped unless they happen to grow that way. The comments in the application about optimizing the edge effect should be eliminated unless the applicant provides specific means by which this will be accomplished.

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-341.100, The applicant needs to clarify the reclamation timetable in Table 3-3. There are terms used in this schedule that are not explained elsewhere in the application. Also, it is not clear where and in what sequence seeding and mulching listed for September 1, 2025, and September 30, 2025, would occur.

R645-301-341.110, R645-301-354, Table 3-3 indicates seeding and mulching could begin as early as September 1. Seeding of most species should be delayed until

as late in the fall as possible, preferably until November. Seeding of warm season grasses should be done in the summer.

R645-301-341, The applicant needs to show how sufficient quantities of soil will be salvaged and redistributed to allow achievement of the revegetation performance standards. The Division finds specifically that it is necessary to remove, stockpile, and redistribute subsoil to achieve revegetation success, and the plan proposed by the applicant would not allow for adequate vegetation establishment. Some of the deeper subsoils, below the roots, have very high rock contents, and some are derived from marine shales that could severely limit vegetation establishment and growth. If these materials were in the main rooting zone, it would be difficult or impossible to achieve revegetation success.

R645-301-341, Areas of coal mine waste disposal need to be covered with at least four feet of the best available nontoxic, noncombustible material to achieve revegetation in accordance with the R645-301-350 performance standards.

R645-301-341, Section 341.220 says tillage will continue until the size of the average soil clods on the surface is less than one inch. This is likely to unnecessarily compact the soil, and it reduces soil structure. It may be necessary to break up the largest clods, but continuing to till the soil until soil clods are less than one inch diameter is not necessary or desirable in this kind of site.

R645-301-341, The applicant needs to resolve inconsistencies in the reclamation methods shown in Section 341.220, Chapter 2, and Appendix 5-8. According to Section 341.220, the surface will be covered with 2000 pounds per acre of alfalfa or native grass hay which is crimp-disced into the soil, but this is not mentioned in Appendix 5-8. Appendix 5-8 and Chapter 2 discuss gouging but Section 341.220 does not.

R645-301-341, The Division considers water harvesting, such as gouging, to be an essential component of reclamation at this site. Any reclamation methods inconsistent with leaving a rough surface need to be modified or eliminated. In Appendix 5-8, the applicant commits to gouging the site, and crimp discing mulch and drill seeding are likely to reduce the gouges so they will not be as effective as they need to be.

R645-301-341, The application gives an approximate size for gouges, but the size shown is the minimum that should be used. The application should specify that the size shown will be the minimum size used.

R645-301-341, Assuming gouging will be the water harvesting method used, the applicant needs to describe how the gouges will be placed.

R645-301-341.210, Blue grama is an important warm season grass in the proposed disturbed area, and it needs to be included in the seed mix for final reclamation.

Bluebunch wheatgrass is approximately an ecological equivalent of Salina wild rye, the dominant grass at the site. It should also be included in the seed mix.

R645-301-341.250, The proposed seed mixture includes introduced species that may not be desirable and necessary for achieving the postmining land use. The applicant needs to either eliminate these species from the seed mix or justify using them.

R645-301-341.210, The seeding rate shown in Table 3-4 is excessive. The Interagency Forage and Conservation Planting Guide for Utah recommends a broadcast seeding rate of 50-100 seeds per square foot.

R645-301-341.230, The application does not say what mulching method or rate will be used in accessible areas. It also does not say at what rate the straw mulch would be applied. If an area is inaccessible and would have straw applied, it would also be inaccessible to equipment needed to crimp the straw. The applicant needs to clarify the mulching methods and rates.

R645-301-341, The application says in Section 357.301 the Lila Canyon Mine would like to reserve the right to apply for augmentation of reclaimed areas without jeopardizing or extending the bond liability period on a site specific case scenario. Augmented seeding is not allowed without lengthening the extended liability period; therefore, the statement in 357.301 must be modified.

R645-301-341.250, The application says the reference area for the mine site disturbance was established adjacent to the existing facilities during the summer of 1985. It appears this statement is referring to the current Horse Canyon mining and reclamation plan. If the applicant intends to use the reference area at the Horse Canyon Mine, the application needs to include all pertinent data to compare the reference area with the proposed disturbed area.

R645-301.341.250, As discussed in the "Vegetation Resource Information" section of this analysis, there is inadequate information to determine whether the reference areas shown in Appendix 3-2 can be approved as success standards for vegetation cover or other vegetation parameters.

R645-301-341.250, The applicant needs to propose methods for measuring diversity, seasonality, and erosion control, and success standards for these parameters.

R645-301-341.250, The applicant needs to include the woody plant density success standard of 1500 per acre established in consultation between the Division and the Division of Wildlife Resources.

R645-301-342, In Section 342, the application says the sediment pond will be maintained through the life of the operation and bond liability period at which time it will be allowed to pass through normal pond succession until such time as the pond will be removed when effluent criteria are met at about year six

following reclamation. This statement contradicts itself and other parts of the application and needs to be modified. The applicant needs to clarify how long the pond will be allowed to remain and what maintenance will be done. To leave the pond as wildlife habitat enhancement, the applicant would need to demonstrate that water in the pond would be suitable for wildlife use.

R645-301-342, The applicant needs to investigate whether other enhancement measures could be used at this site during the reclamation phase of operations. The application should contain a discussion of potential enhancement measures.

R645-301-342, Comments in the application about optimizing the edge effect should be eliminated unless the applicant provides specific means by which this will be accomplished.

Because precipitation figures in the application are inconsistent, the Division cannot be certain whether the species in the seed mix are adapted to the site. Some changes may be needed when the Division has reliable precipitation data.

CESSATION OF OPERATIONS

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-541.

Analysis:

The Permittee committed to comply with R645-301-515 and R645-301-541 for temporary and permanent cessation. In the event of temporary cession that will last more than 30 days the Permittee will notify the Division. After permanent cessation the Permittee committed to remove all equipment and surface structures.

Findings:

The Permittee met the minimum requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Affected area boundary maps.

Plate 5-4 shows the boundaries of all lands that are expected to be affected by the Lila Canyon project. Plate 5-6, Plate 5-7A and Plate 5-7B show the reclamation topography and cross section. Since the reclamation work will be completed in 6 months the Permittee does not need to show the timing and sequence of reclamation.

Bonded area map.

Plate 5-6 shows the area for which a reclamation bond will be posted.

Reclamation backfilling and grading maps.

Plate 5-6, Plate 5-7A and Plate 5-7B show the reclamation contours and cross sections. Plate 5-6 needs to show the center lines of the cross section. The Permittee must give the Division cross sections that show reclamation of the portal areas. That would be best done if some cross section that are perpendicular to the current cross section were included in the PAP.

Reclamation facilities maps.

The Permittee will not leave any facilities after final reclamation. Therefore, such a map is not needed.

Reclamation monitoring and sampling location maps.

There are no specific reclamation ground-water or surface-water monitoring plans. Ground-water and surface-water monitoring will continue through mining and reclamation until bond release (Sections 731.214 and 731.224).

Reclamation surface and subsurface manmade features maps.

The Permittee does not proposes to leave any surface or subsurface manmade features in the reclaimed area.

Findings:

R645-301-542, Plate 5-6 must show the center lines for the cross section in Plate 5-7A and Plate 5-7B.

R645-301-542, The Permittee must give the Division detailed cross section that show highwall elimination. The Division suggests that the cross sections that show highwall elimination be perpendicular to the cross section on Plate 5-7A and Plate 5-7B.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

Analysis:

Determination of bond amount.

The Division will not review this section until the reclamation plan has been approved.

Findings:

The Division will review this section after the reclamation plan has been approved.

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30 CFR